PUNCHLINE Algebra

Practice Puzzles for Algebra 1 Book A

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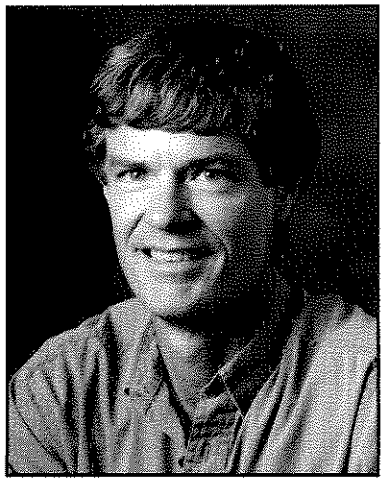

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Notes from the authors . . .

Algebra students need to master a boggling array of procedural skills. In addition, they need to deepen their understanding of underlying concepts. Perhaps the best way for them to build meaningful concepts is within the context of carefully designed problems. In the process of exploring a problem, students experience important mathematical ideas. We believe, though, that an excellent adjunct to this method is the use of carefully structured and sequenced sets of practice exercises. Students construct meaning as they work through the exercises. And some skills, we believe, must be practiced until they are automatic. Certain features are designed into *Punchline* puzzles to make this practice more effective:

CAREFUL EXERCISE SELECTION. Exercises are sequenced to guide students in incremental, step-by-step fashion toward understanding of the concept or procedure involved. Students practice through an appropriate range of applications for the topic, and important variations and discriminations are highlighted. Exercise sets are designed to be challenging but doable, though the amount of instruction required will vary with the experience of the students.

KNOWLEDGE OF RESULTS. We all need feedback and confirmation when we work, especially when learning new skills. Built into *Punchline* puzzles are various devices for giving the student immediate feedback as exercises are completed. For example, if an answer is not in the scrambled answer list or code, the student knows it is incorrect. The student can try again or ask for help. Teachers are able to spend more time helping students who need help and less time confirming correct answers. Students work with greater confidence.

MOTIVATING GOALS FOR STUDENTS. "Why Was the Nearsighted Snake Unhappy?" Each puzzle title is an engaging riddle. Students construct the punchline in the process of checking their answers. The humor acts as an incentive, because students are not rewarded with the punchline until they complete the exercises. While students may wonder aloud who thinks of such dumb jokes, they secretly enjoy them and look forward to solving the puzzles. In addition, discovering the punchline gives a sense of closure and success. Incidentally: "He found out that his girl friend was a garden hose."

OPPORTUNITIES TO WORK WITH A PARTNER. Several puzzles in this book are designed for partners. Each student does essentially the same exercises but with different numbers. Partners must work together to get the punchline. Students are encouraged to help each other, since both use the same solution processes, but not copy each other, since the numbers are different. There is interdependence combined with individual accountability, the twin hallmarks of effective cooperative learning. Together they produce an additional source of student motivation.

In an effort to make these puzzles easy to use, we have organized them into 20 sections that correspond to chapters in many algebra textbooks. Each puzzle is designed for a specific topic listed in the Table of Contents and on the page itself. Many puzzles provide space for student work. Hopefully, their self-correcting feature will lighten the burden of correcting assignments. We hope you enjoy them!

Steve and Janis Marcy

Authors' Suggestions on What to Expect from Students

We expect our students to complete every exercise even if they discover the puzzle punchline earlier. We expect them to show the process used to complete each exercise. If it's done mentally, they write "what they think." It's not enough to simply mark the answers in the answer column. Unless there is abundant workspace on the puzzle, we expect students to show their work on extra sheets of notebook paper. Work must be clear and legible. To demonstrate that they checked their answers, students are expected to fill in the letters or words that form the punchline. (They are *not* required to laugh, but it's OK if they do.)

We find that one of the most powerful ways to improve the quality of student work is to periodically make a transparency of exemplary work and show it to the class.

We encourage students to highlight their errors. Errors are opportunities for learning, we tell them, and they must discover the cause of each error in order to avoid repeating it. One secret of success, we say, is to pursue relentlessly an understanding of mistakes. Ask questions!

Puzzles for partners are not accepted until both parts are complete. Each student is expected to help his/her partner complete the work, and the student gets less credit when this doesn't happen.

We expect students to work hard to learn and remember what they are practicing.

Peggy Sue and the Value of Mathematics

In the 1986 movie *Peggy Sue Got Married*, Kathleen Turner, an unhappily married wife and mother, magically returns to relive her senior year at Buchanan High. One day she leaves a math test blank and, when her teacher demands an explanation, she exclaims: "Mr. Snelgrove, I happen to know that in the future, I will never have the slightest use for algebra. And I speak from experience."

Many adults loved this line, presumably because they, too, have found not the slightest use for algebra. As algebra teachers, then, it is incumbent upon us to imbue the subject with meaning and relevance whenever possible.

The approach to the subject that prevails today is, we think, an attempt to do just that. The heart of this approach is a greater emphasis on using algebra to model real-world situations. Students are easily boggled by the multitude of procedural skills and rules for algebra, so our job is to show them as often as possible real-world applications. Algebra enables us to represent situations in terms of equations and formulas, charts and tables, functions and graphs. Equations help us solve problems by guiding us through the needed arithmetic. Functional relationships can be plugged into calculators and computers, enabling us to experiment by manipulating variables (letting them *vary*) to answer "what if" questions. Graphs show the covariation among variables in a visual, geometric way that helps illuminate the relationships. All of these mathematical representations can give us a deeper understanding of what's going on.

For this book, we have tried to develop both exercises and entire puzzles in which students use algebra to model real-world situations. They will help you make the case that mathematics is just beneath the surface of much everyday experience, and that understanding the mathematics can make that experience more meaningful.

Finally, we would suggest that the analytical nature and structure of mathematics helps students acquire a valuable way of thinking. With its rigor and logic, algebraic thinking models the kind of process needed in many arenas outside mathematics. We hope that your students will glimpse the intrinsic power and beauty of the subject. Peggy Sue, we must assume, never did.

Table of Contents • Book A

Pages 10.9 and 10.10 may be useful as overhead transparencies. In each case, there is space on the left for equations and work, then a coordinate grid on the right to graph the results. Page 32 of the Answer Section provides transparency masters for use with pages 6.2 and 7.15.

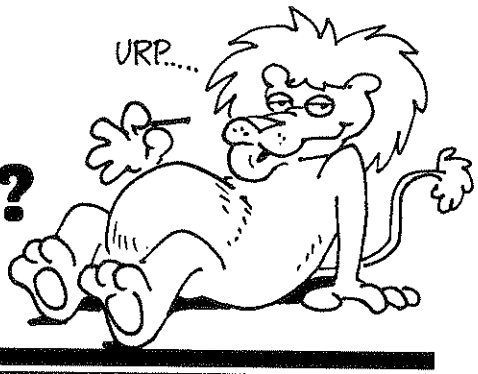
Table of Contents • Book B

11. EXPONENTS AND EXPONENTIAL FUNCTIONS

12. OPERATIONS WITH POLYNOMIALS

13. FACTORING POLYNOMIALS

Why Did the Lion Eat the Tightrope Walker?



Write the letter of each exercise in the box containing the answer.
Answers for the top half of the page are in the top row of boxes.

Evaluate for $w = 5$, $x = 2$, $y = 8$.

E $9x$

N $w + x + y$

A $y - 1$

D $w \cdot w$

H xw

E $4(x + y)$

E $\frac{xy}{4}$

S $7.5 - w$

Evaluate for $p = 3$, $q = 10$, $d = 9$.

A $0.5d$

W $\frac{3q}{2p}$

R $\frac{1}{5}q$

H $3.8(q - d)$

E $2(p + q)$

T $\frac{p + q + d}{2}$

L $100 - d$

M $(q \cdot q \cdot q) - 1$

2.5	10	26	8.5	5	4.5	15	11	18	25	19	3.8	4	2	815	999	40	7	91

Evaluate for $a = 12$, $b = 7$, $c = 4$.

A ac

D $48 - (a + c)$

O $\frac{5a}{8}$

E $\frac{ab}{c}$

E $(2b) + (5c)$

N $c(9.2)$

L $\frac{72}{2c}$

T $\frac{2}{3}a$

Evaluate for $m = 6$, $n = 15$, $e = \frac{1}{3}$.

A $3(m + n)$

B $5[n - (m + 1)]$

B en

C $e(m + n)$

E $\frac{n}{m}$

W $2m(n - 3)$

L $4(e + e + e)$

L $\frac{m}{n} \cdot \frac{n}{m}$

8	7.5	200	5	21	1.5	144	34	4	9	12	40	63	1	48	36.8	7	2.5	32

What Did Zero Say to Eight?

For each set of exercises, there is one extra answer. Write the letter of this answer in the corresponding box at the right. (Some answers are rounded.)

5	3	7	1	8	4	6	2

1 **Write the expression in exponential form.**

a. $x \cdot x \cdot x \cdot x \cdot x$

b. x to the ninth power

c. $5 \cdot x \cdot x \cdot x$

d. $5x \cdot 5x \cdot 5x$

P $5x^3$ O x^9 J $(5x)^3$ E $5x^5$ V x^5

2 **Write the expression in exponential form.**

a. n squared

b. n cubed

c. $7 \cdot n \cdot n \cdot n \cdot n$

d. $7n \cdot 7n \cdot 7n \cdot 7n$

D n^3 Y $(7n)^4$ T $4n^7$ I n^2 R $7n^4$

3 **Evaluate the power.**

a. 11^2

b. 2^7

c. 3^4

d. 10^5

O 100,000 T 121 I 10,000 U 81 A 128

4 **Evaluate for the given value of the variable.**

a. 4^e for $e = 3$

b. p^2 for $p = 15$

c. 5^x for $x = 4$

d. d^3 for $d = 8$

G 64 E 492 L 512 P 225 C 625

5 **Evaluate for the given values of the variables.**

a. $(5w)^2$ for $w = 4$

b. $(x + y)^3$ for $x = 10,\ y = 3$

c. $a^2 \cdot b^5$ for $a = 7,\ b = 2$

d. $(m - n)^8$ for $m = 6,\ n = 5$

N 1648 P 1 S 400 R 1568 T 2197

6 **Evaluate for the given value of the variable.**

a. $y^3 - 8$ for $y = 5$

b. $\left(\frac{3}{4}\right)^u$ for $u = 2$

c. q^1 for $q = 17$

d. $\left(\frac{1}{2}\right)^n$ for $n = 3$

R $\frac{9}{16}$ E 117 A $\frac{1}{8}$ N 17 L $\frac{3}{8}$

7 **Find the area of the square.**

a. 5 cm

b. 3.5 ft

c. 9.2 cm

d. 14 ft

D 12.3 ft^2 R 84.6 cm^2 C 216 ft^2 F 196 ft^2 T 25 cm^2

8 **Find the volume of the cube.**

a. 4 in.

b. 2.5 m

c. 12 in.

d. 10 m

T 1728 in.^{3} B 1618 in.^{3} D 64 in.^{3} M 1000 m^3 S 15.6 m^3

How Can You Avoid Getting a Flat Tire?

Write the letter of the answer in the box containing the exercise number. If the answer has a solid circle, fill in the box instead of writing a letter.

Simplify the expression.

1. $90 + 9 \cdot 2$
2. $30 - 15 \div 5$
3. $4 \cdot 3 + \frac{35}{5}$
4. $64 \div 8 \cdot 2^2$
5. $7 + 2(15 - 6)$
6. $\frac{16 \cdot 3 - 4}{16 - 3 \cdot 4}$
7. $25 - (2 + 2) \cdot 3$
8. $7 \cdot 3^2 - 20 + 1$

Evaluate for the given values of the variables.

17. $8 + 3n$ for $n = 6$
18. $(8 + 3)n$ for $n = 6$
19. $90 - 4d$ for $d = 3$
20. $7x + 2y$ for $x = 15, y = 20$
21. $\frac{8b + 1}{7 - 2a}$ for $a = 2, b = 4$
22. $2 + 5x^2$ for $x = 4$
23. $2 + (5x)^2$ for $x = 4$
24. $(2 + 5x)^2$ for $x = 4$

O	27	K	11
●	32	O	26
P	39	R	402
A	25	D	78
E	108	H	484
●	44	O	145
I	11	●	66
K	19	N	428
T	13	●	82

Simplify the expression.

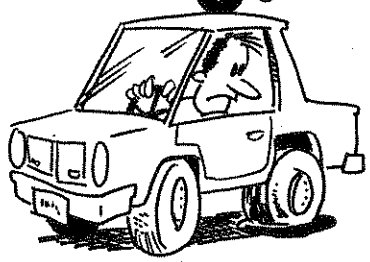
9. $6(5 - 3)^3$
10. $9(15 - 3 + 4)$
11. $9[15 - (3 + 4)]$
12. $10^2 + 7\left(\frac{60}{5}\right)$
13. $\frac{2}{5}(4 + 4 \cdot 4)$
14. $18 \div 2 \cdot 3 + 5^3$
15. $\frac{8 + (7 - 1)^2}{20 - 9 \cdot 2}$
16. $5[4^3 - 2(9 + 6)]$

Evaluate for the given values of the variables.

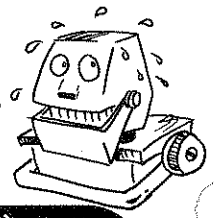
25. $3[n + 2(11 - n)]$ for $n = 6$
26. $x^2 + xy - y^2$ for $x = 10, y = 3$
27. $7 + ab^3$ for $a = 8, b = 5$
28. $\frac{36 + 4kt}{36 - 4kt}$ for $k = 2, t = 3$
29. $100 - 2d^2 \div 9$ for $d = 6$
30. $\frac{1}{4}(m - 1)^2$ for $m = 9$
31. $\left[\frac{1}{4}(m - 1)\right]^2$ for $m = 9$
32. $5 + 5w - \frac{w}{5}$ for $w = 15$

T	144	F	92
●	184	S	83
R	170	R	77
H	72	U	16
N	152	L	1007
S	166	O	4
O	48	●	121
E	22	F	48
O	8	T	5

27	9	20	21	12	2	30	7	4	25	13	16	18	28	11	15
29	17	32	3	26	6	14	22	10	24	1	8	23	31	5	19



Why Don't Robots Ever Panic?



Each equation is either (1) true because of the commutative property, (2) true because of the associative property, or (3) false. Mark the correct choice, then write the corresponding letter in the box containing the exercise number.

1 $m + 8 = 8 + m$
- **E** - TRUE (commutative property)
- **J** - TRUE (associative property)
- **C** - FALSE

2 $m \cdot 8 = 8 \cdot m$
- **S** - TRUE (commutative property)
- **V** - TRUE (associative property)
- **P** - FALSE

3 $m - 8 = 8 - m$
- **O** - TRUE (commutative property)
- **X** - TRUE (associative property)
- **A** - FALSE

4 $m \div 8 = 8 \div m$
- **I** - TRUE (commutative property)
- **L** - TRUE (associative property)
- **E** - FALSE

5 $3 + (4 + x) = (3 + 4) + x$
- **S** - TRUE (commutative property)
- **T** - TRUE (associative property)
- **M** - FALSE

6 $3 \cdot (4x) = (3 \cdot 4)x$
- **A** - TRUE (commutative property)
- **E** - TRUE (associative property)
- **K** - FALSE

7 $3 - (4 - x) = (3 - 4) - x$
- **P** - TRUE (commutative property)
- **S** - TRUE (associative property)
- **H** - FALSE

8 $3 \div (4 \div x) = (3 \div 4) \div x$
- **U** - TRUE (commutative property)
- **G** - TRUE (associative property)
- **O** - FALSE

9 $3 + (4x) = (3 + 4)x$
- **R** - TRUE (commutative property)
- **O** - TRUE (associative property)
- **H** - FALSE

10 $9 + (a + b) = (a + b) + 9$
- **E** - TRUE (commutative property)
- **W** - TRUE (associative property)
- **F** - FALSE

11 $9 + (a + b) = (9 + a) + b$
- **T** - TRUE (commutative property)
- **S** - TRUE (associative property)
- **N** - FALSE

12 $9 + (a + b) = 9 + (b + a)$
- **E** - TRUE (commutative property)
- **A** - TRUE (associative property)
- **I** - FALSE

13 $5(2d) = (2d)5$
- **L** - TRUE (commutative property)
- **D** - TRUE (associative property)
- **N** - FALSE

14 $5(2d) = (5 \cdot 2)d$
- **T** - TRUE (commutative property)
- **V** - TRUE (associative property)
- **D** - FALSE

15 $5(2d) = 5(d \cdot 2)$
- **F** - TRUE (commutative property)
- **N** - TRUE (associative property)
- **R** - FALSE

16 $11 + (6y) = 11 + (y \cdot 6)$
- **Y** - TRUE (commutative property)
- **S** - TRUE (associative property)
- **N** - FALSE

17 $11 + (6y) = (6y) + 11$
- **V** - TRUE (commutative property)
- **C** - TRUE (associative property)
- **T** - FALSE

18 $11 + (6y) = (11 + 6)y$
- **R** - TRUE (commutative property)
- **P** - TRUE (associative property)
- **E** - FALSE

19 $p(7q) = (p \cdot 7)q$
- **G** - TRUE (commutative property)
- **N** - TRUE (associative property)
- **S** - FALSE

20 $p + (7 + q) = (p + 7) + q$
- **W** - TRUE (commutative property)
- **R** - TRUE (associative property)
- **T** - FALSE

21 $p - (7 + q) = (p - 7) + q$
- **H** - TRUE (commutative property)
- **P** - TRUE (associative property)
- **T** - FALSE

5	9	12	16	7	3	14	10	19	1	20	17	6	11	8	15	2	21	18	4	13

What Happens When You Step on the Brakes?

Use the code key to write the appropriate code letter next to each equation. Then write that letter in the box containing the number of the exercise.

CODE KEY FOR LEFT SIDE:

- commutative property of addition → I
- commutative property of multiplication → U
- associative property of addition → Y
- associative property of multiplication → S
- identity property of addition → E
- identity property of multiplication → A
- THE STATEMENT IS FALSE → T

CODE KEY FOR RIGHT SIDE:

- commutative property of addition → D
- commutative property of multiplication → R
- associative property of addition → N
- associative property of multiplication → L
- identity property of addition → H
- identity property of multiplication → F
- THE STATEMENT IS FALSE → O

1. $n + 5 = 5 + n$ ( )
2. $d \cdot 8 = 8 \cdot d$ ( )
3. $5 \cdot (x \cdot y) = (5 \cdot x) \cdot y$ ( )
4. $k + (e + 9) = (k + e) + 9$ ( )
5. $w \cdot 1 = w$ ( )
6. $(p + q) + 7 = 7 + (p + q)$ ( )
7. $(p + q) + 7 = p + (q + 7)$ ( )
8. $y + 0 = y$ ( )
9. $(x \cdot 4)5 = x(4 \cdot 5)$ ( )
10. $a + (b \cdot c) = a + (c \cdot b)$ ( )
11. $a + (b \cdot c) = (b \cdot c) + a$ ( )
12. $a + (b \cdot c) = (a + b) \cdot c$ ( )
13. $a \cdot (b \cdot c) = (a \cdot b) \cdot c$ ( )
14. $7 \cdot (m \cdot 2) = 7 \cdot (2 \cdot m)$ ( )
15. $7 \cdot (m \div 2) = 7 \cdot (2 \div m)$ ( )
16. $10 + (m + 3) = 10 + (3 + m)$ ( )
17. $10 + (m - 3) = 10 + (3 - m)$ ( )
18. $10 + (3 + m) = (10 + 3) + m$ ( )
19. $9(x \cdot 2) = 9(2x)$ ( )
20. $9(2x) = (9 \cdot 2)x$ ( )
21. $t + (d - d) = t$ ( )
22. $\frac{h}{k} \cdot \frac{n}{n} = \frac{h}{k}$ ( )
23. $\frac{h}{k} \cdot \frac{n}{m} = \frac{h}{k}$ ( )
24. $7y + (2y + 6) = (7y + 2y) + 6$ ( )
25. $7y \cdot (2y + 6) = (7y \cdot 2y) + 6$ ( )
26. $\frac{w}{3} \cdot \frac{ab}{ab} = \frac{w}{3}$ ( )

4	17	2	19	20	11	22	8	6	13	1	18	7	23	10	14	26	15	25	12	3	21	5	24	16	9

How Did Coach Trax Teach Tonka to High Jump?

For each set of exercises, there is one extra answer. Write the letter of this answer in each box containing the number of that set.

For Sets 1-4, multiply the fraction by 1. Use the indicated expression for 1.

1	a. $\frac{7}{8}$ Use $\frac{3}{3}$ for 1.	b. $\frac{9}{2}$ Use $\frac{8}{8}$ for 1.	M $\frac{72}{16}$	U $\frac{72}{24}$	A $\frac{21}{24}$
2	a. $\frac{n}{4}$ Use $\frac{d}{d}$ for 1.	b. $\frac{7n}{4d}$ Use $\frac{2}{2}$ for 1.	I $\frac{nd}{8d}$	O $\frac{nd}{4d}$	E $\frac{14n}{8d}$
3	a. $\frac{2a}{b}$ Use $\frac{3x}{3x}$ for 1.	b. $\frac{a}{3x}$ Use $\frac{a}{a}$ for 1.	L $\frac{6ax}{3bx}$	R $\frac{3a^2}{3bx}$	Y $\frac{a^2}{3ax}$
4	a. $\frac{4e}{9t}$ Use $\frac{et}{et}$ for 1.	b. $\frac{2t}{5e}$ Use $\frac{2e}{2e}$ for 1.	W $\frac{4et}{10e^2}$	B $\frac{4e^2t}{9et^2}$	H $\frac{4et^2}{10et}$

For Sets 5-14, simplify the expression.

5	a. $\frac{25}{35}$	b. $\frac{36}{27}$	c. $\frac{56}{7}$	F $\frac{4}{3}$	N $\frac{4}{7}$	D $\frac{5}{7}$	G 8
6	a. $\frac{12}{60}$	b. $\frac{20}{84}$	c. $\frac{130}{13}$	L 10	S $\frac{1}{5}$	T $\frac{5}{13}$	P $\frac{5}{21}$
7	a. $\frac{3a}{3b}$	b. $\frac{ab}{7b}$	c. $\frac{5a}{10ab}$	J $\frac{a}{10b}$	B $\frac{a}{7}$	D $\frac{1}{2b}$	M $\frac{a}{b}$
8	a. $\frac{x}{6xy}$	b. $\frac{30xy}{80y}$	c. $\frac{64xy}{16xy}$	A $\frac{1}{6y}$	K $\frac{x}{4y}$	O 4	C $\frac{3x}{8}$
9	a. $\frac{30pq}{72p}$	b. $\frac{11q}{99pq}$	c. $\frac{75pq}{45qp}$	P $\frac{5q}{9p}$	V $\frac{5}{3}$	W $\frac{5q}{12}$	D $\frac{1}{9p}$
10	a. $\frac{n^2}{7n}$	b. $\frac{49n}{63n^2}$	c. $\frac{35n^2}{18n^2}$	L $\frac{7}{9n}$	E $\frac{n}{7}$	M $\frac{35}{18}$	S $\frac{7}{2n}$
11	a. $\frac{xy^2}{x^2y}$	b. $\frac{15x^2}{20xy}$	c. $\frac{36xy}{12x^2y^2}$	C $\frac{3}{xy}$	D $\frac{3x}{4y}$	G $\frac{3y}{x}$	F $\frac{y}{x}$
12	a. $\frac{18dw}{15d^2w}$	b. $\frac{16dw^2}{40w^2}$	c. $\frac{21d^2w}{63d^2w^2}$	O $\frac{6}{5d}$	E $\frac{2d}{3w}$	Y $\frac{2d}{5}$	A $\frac{1}{3w}$
13	a. $\frac{75ab}{100ac}$	b. $\frac{28abc}{12ab}$	c. $\frac{42cba}{6abc}$	B 7	L $\frac{7c}{3}$	M $\frac{3b}{4c}$	V $\frac{7}{4b}$
14	a. $\frac{6p^2q}{9q^2r}$	b. $\frac{17qr^2}{7pq^2}$	c. $\frac{55pqr}{35p^2q^2}$	O $\frac{17r}{3pq}$	A $\frac{2p^2}{3qr}$	C $\frac{17r^2}{7pq}$	W $\frac{11r}{7pq}$

4	12	7	1	10	6	8	12	9	6	11	14	2	5	11	14	13	12	3	2	6

What Does Joe Starbuck Never Wear While Drinking Coffee?

Cross out the letter next to each correct answer. When you finish, the answer to the title question will remain.

In Exercises 1-8, use the distributive property to write an equivalent expresssion.

1. $7(x + y)$
2. $4(n + 9)$
3. $5(11 + 2y)$
4. $n(x + y)$
5. $x(x + 8y)$
6. $(9n + 30)2$
7. $7(4x + 3y + 1)$
8. $y(8x + 5y + 6)$

In Exercises 9-16, factor the expression.

9. $6a + 6b$
10. $2a + 18$
11. $ea + eb$
12. $a^2 + 3a$
13. $5b + 60$
14. $eb + 13b$
15. $3a + 9b + 6$
16. $7a^2 + 7a + 35$

In Exercises 17-24, combine like terms.

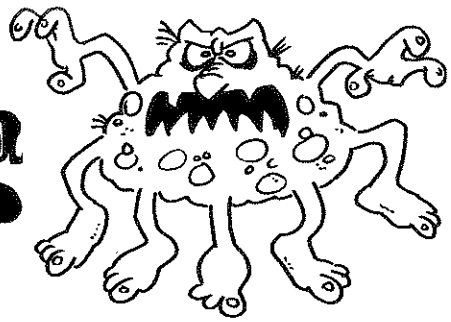
17. $8m + 3m$
18. $4q + 9 + q$
19. $5p + 6q + 12p$
20. $7 + 7p + 16 + p$
21. $2p + 9q + 20 + 3p + 4q$
22. $8p + 5q + 1 + 7p + 7q + 24$
23. $11 + 4m + 5 + m + 18 + 6m$
24. $3q + 10p + 18 + 9q + 38p + q$

Answers 1-8	
18n + 60	O
28x + 10y + 8	I
7x + 7y	N
18n + 36	O
55 + 10y	F
$8xy + 5y^2 + 6y$	A
$x^2 + 8xy$	R
4n + 36	A
28x + 21y + 7	T
8xy + 21y + 6	H
nx + ny	

Answers 9-16	
$7(a^2 + 3b + 8)$	U
$3(a + 3b + 2)$	S
$2(a + 9)$	H
$b(e + a)$	A
$e(a + b)$	N
$5(b + 12)$	T
$6(a + b)$	O
$3(a + 5b + 4)$	S
$7(a^2 + a + 5)$	O
$a(a + 3)$	E
$b(e + 13)$	H

Answers 17-24	
15p + 12q + 25	S
11m	A
11m + 38	I
17p + 6q	T
48p + 13q + 18	O
5p + 13q + 20	P
5q + 9	D
15p + 16q + 18	E
11m + 34	E
48p + 11q + 20	U
8p + 23	P

What Can You Say About a Monster with Five Legs?



Simplify the expression. Write the letter of the exercise in the box that contains the number of the answer.

E $7x + 6 + 2x + 5$	6 $10x$	I $6a^2 + 11a + 3a^2$	8 $3a^2 + 10a + 9$
I $5x + 5y + x + 8y$	3 $15x + 5y + 11$	T $2a^2 + 5a + a^2 + 5a + 9$	17 $9a^2 + 4a + 13b$
S $3x + 4y + 10 + 12x + y + 1$	10 $15x + 3y + 12$	A $4a^2 + 7b^2 + 3a^2 + 18$	2 $9a^2 + 11a$
O $8x + 30y + 75x + 16y + 4x$	22 $9x + 11$	L $3a^2 + 8ab + b^2 + 6a^2 + 7b^2$	14 $7a^2 + 4b^2 + 18$
A $\frac{1}{3}x + \frac{2}{3}x + 9x$	20 $\frac{11}{2}x + 4$	H $5(a^2 + 4) + 2(a^2 + b^2)$	19 $9a^2 + 8ab + 8b^2$
I $x + \frac{1}{2}x + 4 + 4x$	28 $87x + 46y$	M $9(a^2 + b) + 4(a + b)$	23 $9a^2 + 3a + 11b$
	12 $6x + 13y$		24 $7a^2 + 7b^2 + 18$
	18 $\frac{15}{2}x + 4$		1 $7a^2 + 2b^2 + 20$

T $5(n + 2) + 8n + 1$	16 $11n + 104$	P $2(5t + 8) + 9(2t + 1)$	23 $7t^2 + 8tw + 2w^2$
S $n + 4(n + 9) + 20$	4 $9n + 46$	K $1 + 7(4 + 3t) + 5(12 + t)$	11 $44t^2 + 52t + 32$
G $7 + 2(3 + n) + 11n$	9 $5n + 56$	V $4(6t + 5) + 9t + 3(4t + 7)$	21 $26t + 89$
I $3(n + 8) + 8(n + 10)$	15 $26n + 46$	N $t(t + 8) + 5(t^2 + 6)$	27 $7t^2 + 9tw + w^2$
E $9 + 2(15 + n) + 7(n + 5)$	26 $13n + 13$	F $6(6t^2 + 7t) + 2(5t + 16) + 8t^2$	10 $44t^2 + 8t + 30$
H $16(n + 1) + 4n + 6(5 + n)$	25 $26n + 104$	L $3t^2 + t(4t + w) + 8tw + w^2$	29 $45t + 41$
	13 $13n + 11$		5 $28t + 25$
	30 $9n + 74$		7 $6t^2 + 8t + 30$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

What Did the Firefly Say As the Sun Set?

Write an algebraic expression for the phrase. Cross out the number-letter pair above each correct answer. For each number-letter pair that you DON'T cross out, write the letter in the matching numbered box at the bottom of the page.

1. Let n represent an unknown number.

a. eight more than the number

b. three times the number

c. the product of the number and eight

d. three less than the number

e. three decreased by the number

5•B	2•O	14•D	1•R	15•V	8•S	11•W
$8n$	$8-n$	$8+n$	$3-n$	$3n$	$n-3$	$n+3$

2. Let k represent an unknown number.

a. the sum of the number and two

b. the quotient of the number and nine

c. twice the number

d. the difference of nine and the number

e. nine less than the number

15•N	8•C	5•T	1•K	6•Y	14•O	10•A
$9-k$	$k+2$	$9k$	$2k$	$k-9$	$k-2$	$\frac{k}{9}$

3. Let x represent an unknown number.

a. 4 times the sum of 7 and the number

b. 4 times 7 plus the number

c. 7 less than the product of 4 and the number

d. 7 times the quantity 4 more than the number

e. 4 times the quantity 7 less than the number

15•W	1•M	6•R	8•G	10•E	13•D	9•H
$7x+4$	$4(x-7)$	$4(7)+x$	$7(x-4)$	$7(4+x)$	$4(7+x)$	$4x-7$

4. Let u represent an unknown number.

a. two-fifths of the number

b. five more than twice the number

c. five times the sum of the number and two

d. one-fifth of the sum of the number and two

e. half of the quantity five less than the number

10•A	13•R	9•E	1•G	6•O	3•B	12•H
$5(u+2)$	$\frac{2}{5}u$	$\frac{u-5}{2}$	$5u-2$	$\frac{u-2}{5}$	$5+2u$	$\frac{u+2}{5}$

5. Let a represent Atom's age now.

a. Atom's age in three years

b. Atom's age four years ago

c. four times Atom's age three years ago

d. three times Atom's age in four years

e. three years more than four times Atom's age

9•R	3•N	10•O	4•S	7•A	13•N	11•V
$4(a-3)$	$a+3$	$3(a-4)$	$3(a+4)$	$a-4$	$4-3a$	$3+4a$

6. Let w represent the width of a rectangle. The length is 8 cm more than the width.

a. 5 times the width

b. the length

c. 5 times the length

d. 8 cm more than the product of 5 and the width

e. one-eighth of the sum of 5 cm and the width

w ☐

7•O	4•S	9•L	3•R	2•E	9•N	3•T
$w+8$	$\frac{5+w}{8}$	$8(w-5)$	$5(w+8)$	$5w$	$8+5w$	$\frac{w-8}{5}$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

What Happened to the Farmer Who Was Arrested for Selling Rotten Fruit?

Show whether or not the given number is a solution of the open sentence. Indicate "yes" or "no" by circling the appropriate letter in the chart. The answer to the title question is found by reading the circled letters in the "YES" row, then the circled letters in the "NO" row.

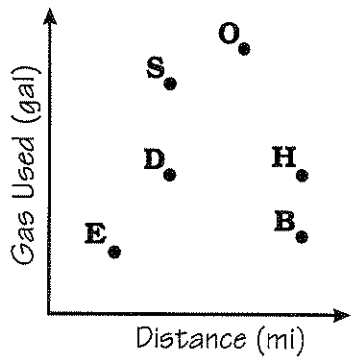
1. $3x + 10 = 25$ {5}
2. $4n - 9 = 52$ {16}
3. $7 + 2y = 97$ {45}
4. $24 = \frac{m}{6} + 15$ {54}
5. $5(d - 2) + 7 = 65$ {14}
6. $8a - 5 > 60$ {9}
7. $8a - 5 > 60$ {8}
8. $4x^2 - 1 = 399$ {10}
9. $(4x)^2 - 1 = 1599$ {10}
10. $(4x - 1)^2 = 1499$ {10}
11. $9 = \frac{n^2 + 11}{18}$ {13}
12. $2v + 15 = 5v - 3$ {7}
13. $2v + 15 = 5v - 3$ {6}
14. $10(t + 7) < 36(t - 6)$ {11}
15. $y^3 - 20 \leq 105$ {5}
16. $\frac{24 - w}{w} \leq 3w - 8$ {4}
17. $7m^2 = 9(4 + m)$ {3}
18. $16e - 5 < e^5$ {2}
19. $x(x + 13) < 2x^2$ {12}
20. $\frac{9h - 6}{5} \geq h + 6$ {9}
21. $\frac{9h - 6}{5} > h + 6$ {9}

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
YES>	H	I	E	W	E	A	N	S	J	A	O	E	U	S	D	O	G	E	R	D	T
NO>	A	B	I	A	Y	T	H	O	A	I	S	P	L	E	N	A	K	S	R	N	S

What Happened to the Reporter Who Dropped Her Laptop?

Write the letter of the correct answer in the box containing the exercise number.

Tripping Out. The graph shows relative distance driven and amount of gas used on road trips taken by 6 people. Based on the graph, write the correct letter.



1 Which person traveled the least distance?

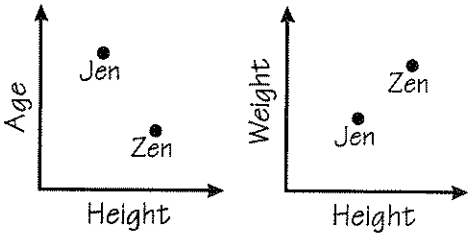
2 Which person used the most gas?

3 Which person traveled the same distance as D?

4 Which person used the same amount of gas as D?

5 Which person got the most miles per gallon?

Two for Two. The two graphs show information for the same two people, Jen and Zen. Each statement below is true or false. Circle the letter of the correct choice.



6 The older person is taller. **N.** true **S.** false

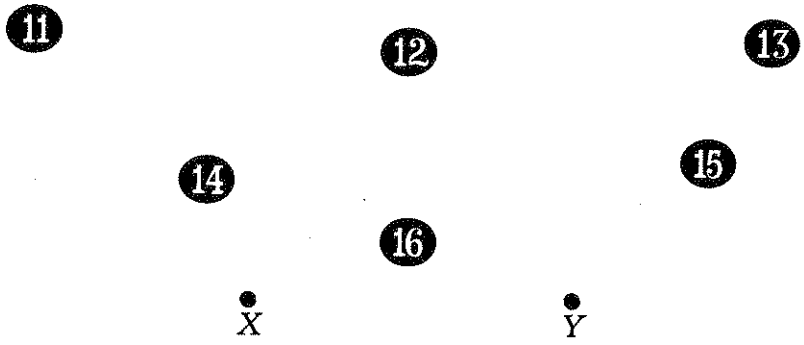
7 The taller person is heavier. **O.** true **U.** false

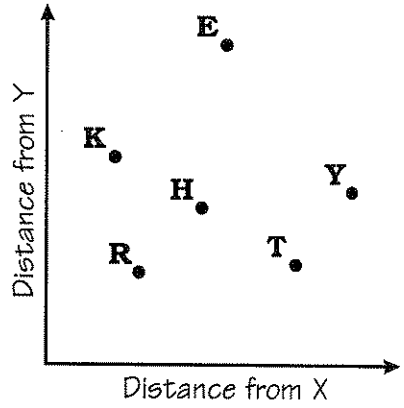
8 The lighter person is younger. **S.** true **T.** false

9 The older person is heavier. **A.** true **E.** false

10 The taller person is younger. **R.** true **L.** false

Estimate. Estimate the relative distance of each black circled number from *X* and *Y*. Find the lettered point in the graph that corresponds to each of these numbers.

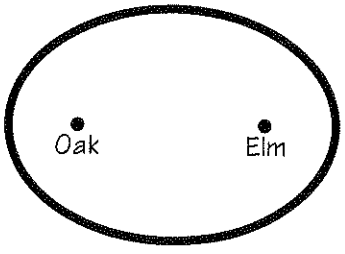


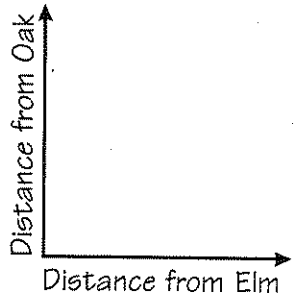


3	12	9	5	16	7	14	1	8	4	11	6	15	2	10	13

EXTRA:

Sparkle runs around an oval track. There are two trees growing inside the track, as shown. Sketch a graph to show her distance from the two trees as she runs around the track.

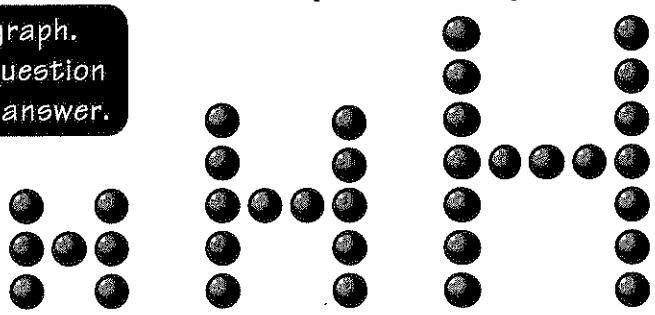




How Do Birds Like to Get Computer Software?

Complete each table and graph. Write the letter of each question in the box containing its answer.

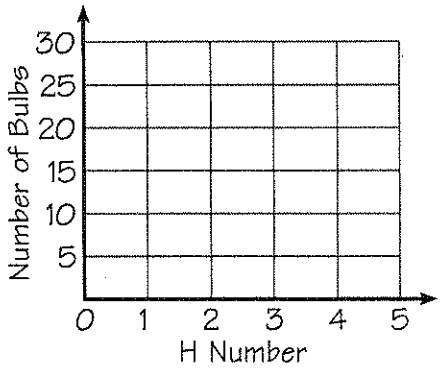
1 The Super H Sign Co. uses light bulbs to make the letter "H" in any size. Draw H #4 in this pattern.



H #1 H #2 H #3 H #4

Complete the T-chart and graph to show the relationship between "H Number" (*H*) and the number of light bulbs (*B*)

H	*B*
1	
2	
3	
4	
5	



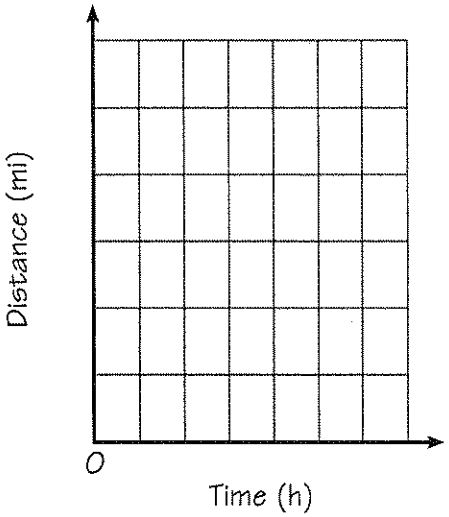
E. How many bulbs are used for H #4?
O. How many bulbs would be used for H #5?
Y. How many bulbs would be used for H #8?

CHALLENGE: Can you write an equation to show the relationship between *H* and *B*?

B =

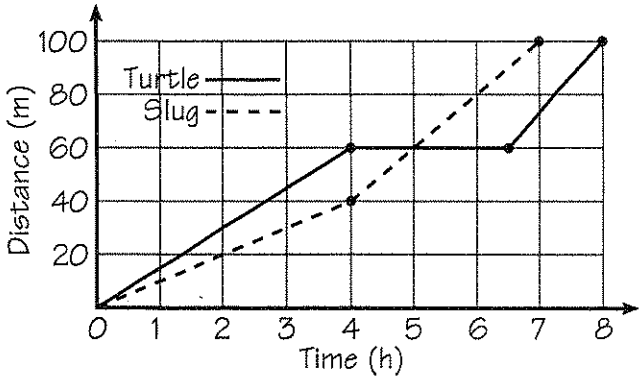
2 Two trains travel on parallel tracks. The North Train leaves Metro Station and travels north at 80 mph. At the same time, the South Train is 420 mi from Metro Station, traveling toward it at 60 mph. Complete the chart and graph showing the relationship between travel time and distance from Metro Station for each train.

Time (h)	Distance (mi)	
	North	South
0	0	420
1	80	360
2		
3		
4		
5		
6		
7		



M. How many hours have the trains been traveling when they pass each other?
E. How far are the trains from Metro Station when they pass each other?
O. How many hours does it take for the South Train to reach the station?

3 **Animal Race**. The graph shows a 100-meter race between Mr. Turtle and Mr. Slug.



N. What was Mr. Turtle's average speed for the first 4 hours (distance divided by time)?
S. What was Mr. Slug's average speed for the first 4 hours?
R. What was Mr. Slug's average speed for the next 3 hours that he ran?
D. What was Mr. Turtle's overall average speed (total distance divided by total time)?

Who Won the Race?

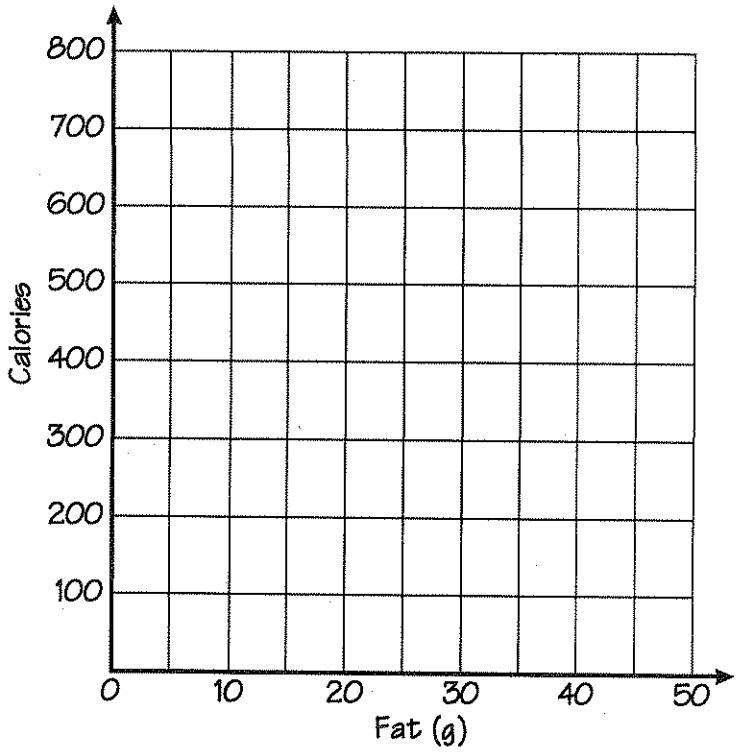
36	27	15 m/h	6 h	10 m/h	22	240 mi	12.5 m/h	42	18 m/h	20 m/h	7 h	3 h	300 mi

SCATTERPLOTS

Construct a scatter plot for each set of data. Describe what kind of relationship, if any, is shown.

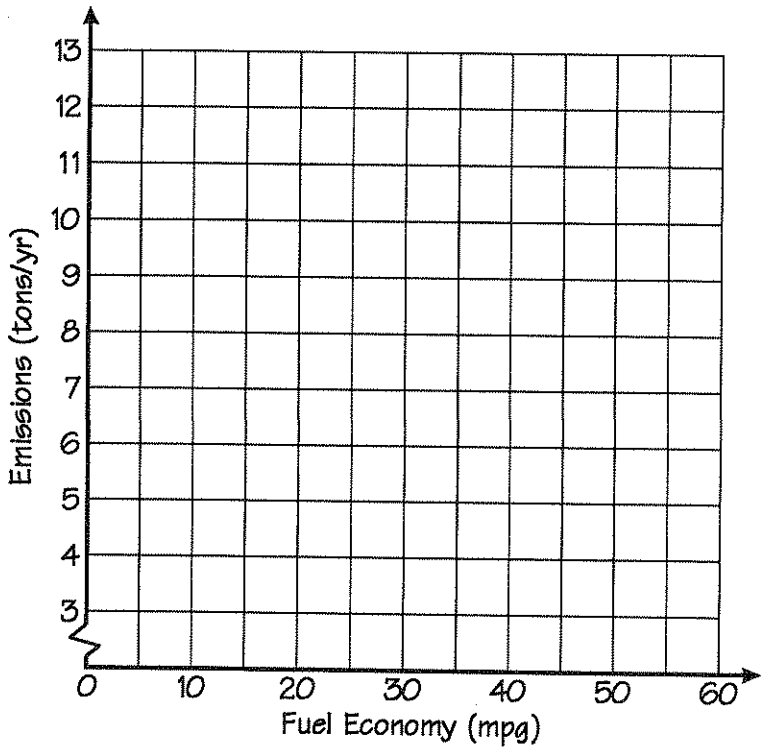
1. Fat and calories for individual servings of items sold at a Burger King®restaurant.

Item	Fat (g)	Calories
Hamburger	13	310
Cheeseburger	17	350
Bacon Double Cheeseburger	34	570
Whopper with Cheese	49	800
Original Chicken Sandwich	28	560
Chicken Whopper	25	570
BK Fish Fillet Sandwich	30	520
Chicken Tenders (5 pc)	12	210
French Fries (medium)	18	360
Onion Rings (medium)	16	320
Side Garden Salad	0	25
Ranch Salad Dressing	15	140
Chicken Caesar Salad	7	230
Caesar Salad Dressing	9	90
Sausage Croissan'wich	39	520
French Toast Sticks (5 pc)	20	390
Vanilla Shake (medium)	17	460
Dutch Apple Pie	14	340
Coca Cola (medium)	0	230



2. EPA fuel economy (city) and greenhouse gas emissions for Toyota vehicles sold in a recent model year.

	Fuel Economy (mpg)	Emissions (tons/yr)
Camry (4 cyl)	23	7.2
Camry (6 cyl)	20	8.1
Celica (4 cyl)	29	6.0
Celica Sports (4 cyl)	24	6.9
Corolla (4 cyl)	29	5.9
Echo (4 cyl)	33	5.4
Highlander (4 cyl)	21	8.4
Highlander (6 cyl)	18	9.2
Land Cruiser (8 cyl)	13	13.0
Matrix (4 cyl)	26	6.8
Prius (4 cyl)	60	3.5
RAV4 (4 cyl)	22	7.9
Sequoia (8 cyl)	14	12.4
Sienna (6 cyl)	18	9.3
Tacoma (4 cyl)	18	9.8
Tacoma (6 cyl)	17	10.5
Tundra (6 cyl)	15	11.3
Tundra (8 cyl)	14	12.1



Why Was the Bloodhound Fired for Finding a Penny?

Evaluate each formula for the given values of the variables. Write the letter of the correct answer in each box with the exercise number. If measurements are given in different units, use the smaller unit for the answer.

$d = rt$ where d is the distance traveled by an object moving at rate r in time t. Find d if

1. $r = 144$ ft/s, $t = 18$ s
2. $r = 56$ mph, $t = 3.5$ h

L 174 mi O 2592 ft
E 196 mi V 2272 ft

$A = lw$ where A is the area of a rectangle with length l and width w. Find A if

3. $l = 2$ ft, $w = 15$ in.
4. $l = 3$ m, $w = 32$ cm

M 384 in.^{2} B 7200 cm^2
U 360 in.^{2} G 9600 cm^2

$s = 16t^2$ where s is the distance in feet a free-falling object travels in t seconds. Find s if

5. $t = 3$ s
6. $t = 8$ s

S 180 ft I 1024 ft
A 996 ft T 144 ft

$V = \frac{e^2h}{3}$ where V is the volume of a square pyramid with base edge of length e and height h. Find V if

7. $e = 9$ in., $h = 4$ in.
8. $e = 9$ in., $h = 4$ ft

W 108 in.^{3} F 994 in.^{3}
N 96 in.^{3} D 1296 in.^{3}

$I = prt$ where I is the simple interest paid on a principal of p dollars invested at interest rate r for time t. Find I if

9. $p = \$500$, $r = 0.08$ per year, $t = 3$ years
10. $p = \$500$, $r = 0.016$ per month, $t = 3$ years

H \$120 S \$254
K \$288 R \$136

$A = \frac{h(b + c)}{2}$ where A is the area of a trapezoid with height h and bases of lengths b and c. Find A if

11. $h = 7$ in., $b = 16$ in., $c = 10$ in.
12. $h = 2.5$ m, $b = 0.52$ m, $c = 0.36$ m

R 91 in.^{2} P 1.1 m^2
N 106 in.^{2} B 1.8 m^2

$d = x + \frac{x^2}{20}$ where d is the approximate stopping distance in feet for an automobile traveling x miles per hour. Find d if

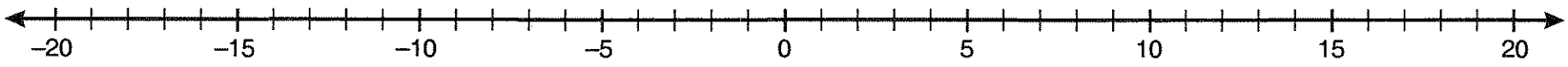
13. $x = 30$ mph
14. $x = 60$ mph

A 84 ft C 240 ft
N 75 ft L 210 ft

9	2	12	6	14	10	2	8	3	12	5	9	2	7	11	1	13	4	14	2	13	5

Why Did Jack Flack Jump Up and Down and Twist All Around Before Taking His Medicine?

Write an integer for each exercise. Find the point on the number line corresponding to that integer. Write the letter of the exercise on the number line at that point.



Write an integer for the situation.

- **T** 5 units to the left of zero
- **L** the opposite of 16
- **N** 19 ft above sea level
- **I** 8° below zero
- **B** a gain of 9 yd
- **A** a debt of $15
- **E** five seconds after liftoff
- **S** two floors down
- **U** the opposite of –16

Write an integer for the expression.

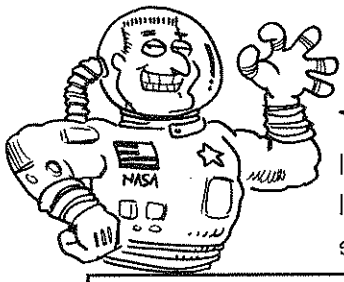
- **T** $-(20)$
- **E** $-(-10)$
- **W** $|-4|$
- **O** $-|-4|$
- **L** $|9 - 2|$
- **F** $|9| + |-2|$
- **D** $-|9 - 2|$
- **I** $2|-9|$
- **E** $-|9 \cdot 2|$
- **L** $-n$ for $n = 12$
- **O** $-b$ for $b = -12$
- **A** $-(-x)$ for $x = -9$
- **E** $|a| + 6$ for $a = -8$
- **H** $-|-d|$ for $d = 19$
- **S** $-|-w|$ for $w = -10$
- **A** $-|e| + 12$ for $e = -12$
- **G** $3|x| + x$ for $x = 5$
- **E** $3|k| - 13$ for $k = -5$

Write an integer for the question.

- **R** Which is less, $|-14|$ or 13?
- **E** Which is less, $|-14|$ or -13?
- **K** Which is greater, -14 or 1?
- **H** Which is greater, -14 or -1?

Write an integer to complete the statement.

- **L** If $|x| = 6$, then $x = -6$ or ____
- **B** If $|n| = 14$, then $n = 14$ or ____
- **S** If $-|y| = -17$, then $y = -17$ or ____



How Did the Astronaut Feel About Going to Mars?

Indicate whether each statement is true (T) or false (F) by circling the appropriate letter next to it. Write this letter in the box containing the exercise number. If the statement is false, explain why or give a counterexample.

	T	F
1. Each of these numbers is a rational number: $-4 \quad \frac{3}{8} \quad 7.2 \quad 5\frac{1}{2}$ **If false, explain:**	E	N
2. Each of these numbers is a rational number: $-3.83 \quad \frac{17}{7} \quad 0.076 \quad -18\frac{5}{6}$ **If false, explain:**	A	L
3. Any number that can be expressed as the ratio of two integers, $\frac{a}{b}$, is a rational number. **If false, explain:**	O	I
4. Any number that can be expressed as the ratio of two integers, $\frac{a}{b}$, where $b \neq 0$, is a rational number. **If false, explain:**	H	T
5. When you divide the numerator of a fraction by the denominator ($\neq 0$), you always get a decimal that ends (a terminating decimal). **If false, explain:**	C	S
6. When you divide the numerator of a fraction by the denominator ($\neq 0$), you always get either a decimal that terminates or a decimal that repeats a digit or block of digits again and again (a repeating decimal). **If false, explain:**	P	N
7. Each of these decimals represents a rational number: $45.0 \quad 0.45 \quad 0.\overline{45}$ **If false, explain:**	E	I
8. This decimal represents a rational number: 0.202002000200002000 0 . . . **If false, explain:**	N	D
9. This decimal represents a rational number: 0.200200200200200200 . . . **If false, explain:**	W	H
10. The decimal for π, 3.1415926535 . . ., never ends and never repeats any group of digits. Therefore, π is a rational number. **If false, explain:**	S	F
11. The value of π can be expressed as a ratio of two integers, such as $\frac{22}{7}$. **If false, explain:**	O	U
12. The decimal for an irrational number never terminates or repeats. The rational and irrational numbers together form the set of real numbers. **If false, explain:**	R	L

EXTRA: Graph each of these rational numbers: **a.** $\frac{7}{3}$ **b.** $-\frac{11}{4}$ **c.** -4.3 **d.** $\frac{5}{8}$

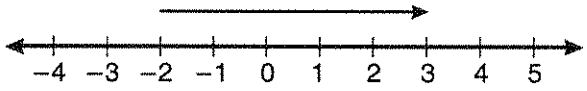
4	7	9	2	5	10	3	12	1	8	11	6

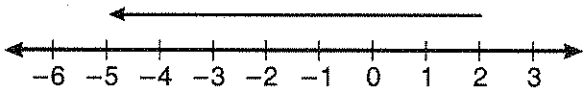
What Do They Call the Toughest Football Team In Town?

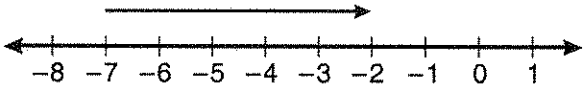
For each set of exercises, there is one extra answer. Write the letter of this answer in each box containing the number of that set.

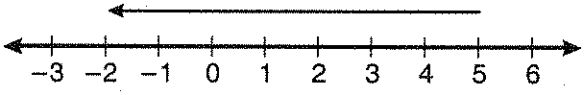
4	6	1	3	7	7	8	5	3	2	8

1 **Write a number sentence for the arrow diagram.**

a. 

b. 

c. 

d. 

U $2 + (-7) = -5$
C $5 + (-7) = -2$
Y $-2 + 5 = 3$
E $-2 + 7 = -5$
F $-7 + 5 = -2$

2 **Find the sum.**

a. $-2 + 9$
b. $3 + (-10)$
c. $-7 + (-4)$
d. $5 + (-13)$
e. $-5 + 38$
f. $-9 + (-44)$
g. $36 + 64$

H 33
V 100
L −7
R 45
K 7
M −8
Z −53
W −11

3 **Find the sum.**

a. $8 + (-5) + 12$
b. $-6 + (-9) + 2$
c. $-11 + 20 + (-1)$
d. $-7 + 3 + 17$
e. $13 + (-4) + (-9)$

T 13
O 0
J −13
A 11
S 15
P 8

4 **Find the sum.**

a. $-5 + (-6) + (-7)$
b. $18 + (-15) + 6$
c. $-10 + (-7) + 2$
d. $-16 + 5 + (-8)$
e. $-9 + 14 + 6$

N 9
T 13
M 11
K −19
L −18
V −15

5 **Find the sum.**

a. $3 + (-4) + 5 + (-6)$
b. $-10 + 7 + (-4) + 2$
c. $-16 + 5 + (-11) + (-8)$
d. $8 + 8 + (-20) + 9$
e. $-10 + (-1) + 2 + 17$

P 5
B −2
C 6
W −30
F 8
U −5

6 **Evaluate if $w = -3$, $x = 10$, $y = -8$.**

a. $w + x + y$
b. $-y + x$
c. $-w + (-x) + 2$
d. $x + y + (-7) + (-w)$
e. $y + 5 + (-y) + 12$

H −8
R 17
O 18
E −2
W −5
I −1

7 **Simplify.**

a. $7n + 2 + 4n + 5$
b. $-5n + 12n + 9 + (-3)$
c. $n + (-4) + (-6n) + (-10)$
d. $8n + (-11n) + 7 + (4n)$
e. $13 + (-6n) + (-15) + (-5n)$

P $7n + 6$
B $n + 7$
S $11n + 7$
L $-5n + (-2)$
N $-5n + (-14)$
M $-11n + (-2)$

8 **Solve mentally.**

a. $x + 2 = 5$
b. $x + 2 = -5$
c. $x + (-2) = -5$
d. $-2 + x = 5$
e. $-x = 5$

O −5
D 3
N −7
S 5
B −3
P 7

Why Did the Sesame Seed Do 15 Extra Math Problems?

Write a simplified expression, then cross out the letter pair next to the correct answer. For each letter pair that you DON'T cross out, write the uppercase letter in the box containing the lowercase letter.

1 $10 + (-3) + (-4)$

2 $-9 + 2 + (-5)$

3 $6 + (-20) + 4$

4 $-\frac{4}{7} + \frac{3}{7} + \left(-\frac{5}{7}\right)$

5 $-\frac{2}{3} + \frac{4}{5}$

q • D -10
g • P $\frac{2}{15}$
l • B 3
f • A $-\frac{1}{15}$
e • V -12
a • M $-\frac{6}{7}$
i • O -7

6 $-7 + (-10) + 2$

7 $-19 + 5 + 12$

8 $64 + (-32) + (-1)$

9 $\frac{1}{3} + \frac{3}{4} + \left(-\frac{7}{12}\right)$

10 $-\frac{2}{5} + \frac{3}{10} + \left(-\frac{1}{4}\right)$

c • T 28
o • M $-\frac{7}{20}$
b • E -15
p • I $\frac{1}{2}$
j • R 31
q • L $-\frac{3}{4}$
h • U -2

11 $6 + 15 + (-3) + (-4)$

12 $(-11) + 5 + (-8) + 7$

13 $(-3) + (-8) + 20 + (-1)$

14 $17 + (-4) + 11 + (-15)$

15 On four plays, a football team had the following changes in position: gained 5 yd, lost 13 yd, lost 4 yd, gained 9 yd. Write an integer to represent the team's overall change in position.

e • J -3
n • K 14
a • S 8
l • A -5
o • O 12
k • H -7
r • E 9

16 $-36 + 12 + 5 + (-12)$

17 $-7 + (-7) + (-7) + 16$

18 $29 + (-8) + 10 + (-3)$

19 $9 + 4 + (-18) + 6$

20 A submarine was cruising at a depth of 40 m. It climbed 9 m, then dove 14 m, then climbed 21 m. Write an integer to represent the depth of the submarine after these changes.

p • O -5
g • S 25
j • L -24
d • S -31
b • I -27
r • D 1
m • T 28

21 $8.7 + 2.5 + (-5.4)$

22 $-3.8 + 7.7 + (-9.2)$

23 $0.65 + (-0.49) + 0.22$

24 $-13.2 + (-18.5) + 14.4$

25 The price of a stock was $32.00. Over the next four weeks, the stock had the following price changes: up $3.12, down $7.45, down $1.92, up $5.54. What was the price of the stock after these changes?

n • C -5.3
a • B -17.3
e • W 32.51
h • N 5.8
m • I 0.38
j • F 31.29
p • L 16.9

26 $5x + 9 + 16x + (-2)$

27 $3x + (-8x) + 7 + (-1)$

28 $-x + (-6) + 12x + (-5)$

29 Suppose x represents the width of a rectangle and $3x + 2$ represents the length. Write an expression for the perimeter of the rectangle.

d • S $8x + 4$
j • N $5x + 8$
k • F $21x + 7$
n • R $11x + (-7)$
m • N $-5x + 6$
h • F $11x + (-11)$

a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r

How Can You Tell Which End of a Worm Is His Head?

Simplify the expression. Write the letter of the exercise in the box above the answer.

C $2 - 9$	H $4 - 36$	E $18 - (-15) - 2$	N $12 - (1 - 5)$
I $-4 - 7$	L $-8 - (-3)$	D $4 + 7 - 20$	H $-3 - (-27 + 4)$
E $6 - (-1)$	I $15 - (-15)$	T $-15 - (-6) + 1$	L $-60 - (-8 - 3)$
M $89 - 5$	T $-70 - 20$	E $9 - 13 - (-44)$	M $-9 - 9 - 9 - 9$
I $-5 - (-16)$	K $-39 - (-41)$	I $-7 - (-18) + (-10)$	D $5 - (-8) - 40 + (-2)$

−90	11	−7	2	−5	7	72	−32	30	84	−8	−11	16	24	−8	20	31	−33	−36	1	−29	−9	−49	40

E $14 - (-9) - 25 + 6$	W $3x - 8x - 8x$	A $20 - (-17 - 1 + 4)$	U $5t + 6 - 2t - 11$
C $-27 - (-34) + (-8) - 5$	S $x - (-9x) - 15x$	S $-15 - (-2) - (11 - 6)$	E $-8t - 51 - t + 3$
D $-17 + 10 - 61 - (-3)$	N $-4x + (-7x) - (-2x)$	H $-98 + 3 + (-9 - 4)$	L $99 - 12t - (-7t) - 4$
I $8 - 11 - (-50) - 38$	E $24x - 18x - (-5x)$	D $-20 + 30 - 40 - (-50)$	G $-5 + 16t - 9t - (-2t)$
A $7 - 16 - (-3 - 4)$	H $-7x - (-22x) - x$	H $-1 - (-16) - (-2 + 7)$	N $-13t + 49 - (-14t) - t$

−2	−9x	−65	12x	−5x	11x	4	−4	−13x	14x	9	−6	−108	6t − 5	−9t − 48	49	20	30	−5t + 95	34	3t − 5	9t − 5	10	−18

What Did Doctor Bob Do With a Bunch of Sick Balloons?

For each set of exercises, there is one extra answer. Write the letter of this answer in each box containing the number of that set.

7	2	8	1	9	2	5	8	3	7	2	10	9	6	4

1. Simplify.

a. $9 + (-2) - 15$

b. $-8 - (-5) + 20$

c. $14 - 36 - (-25)$

d. $-3 - (-14 - 2)$

K 3 V −8 R 9 E 13 B 17

2. Simplify.

a. $16 - (-5) + (-12)$

b. $-7 + (-8) - 32$

c. $-27 - (-10) + 6$

d. $180 - (-45 + 90)$

A 135 O 9 T −47 E 110 P −11

3. Solve.

a. The temperature in Sunnyside was 76°F. The temperature in Frostbite was −18°F. What was the difference in these two temperatures?

b. At 6:00 P.M., the temperature in Oshgon was −7°F. By midnight, the temperature had dropped 22°. Find the temperature at midnight.

O 24°F C −29°F D 94°F

4. Solve.

a. Teton was hiking at an elevation of 1650 ft. He had the following changes in elevation: up 150 ft, down 670 ft, up 320 ft. What was his elevation then?

b. The top of Acme Tower is 1380 ft above ground level. The bottom of the tower is 30 ft below ground level. How tall is the tower?

N 1450 ft M 1430 ft P 1410 ft

5. Simplify.

a. $20 + (-7) - 8 - 8$

b. $-5 - (-11) - 14 + 3$

c. $-24 - (7 - 10 + 1)$

d. $8 - (-3) - (4 - 9)$

D −15 L −5 W 16 N −22 G −3

6. Evaluate if $a = -8$, $b = -3$, $c = 10$.

a. $a + b + c$

b. $a - b - c$

c. $-a + b - c$

d. $-a - b + c$

A −1 U 16 I −5 L 21 S −15

7. Simplify.

a. $-\frac{11}{16} + \frac{1}{16} - \left(-\frac{7}{16}\right) - \frac{3}{16}$

b. $\frac{3}{8} - \frac{2}{3} + \frac{7}{12}$

H $\frac{5}{12}$ S $-\frac{3}{8}$ B $\frac{7}{24}$

8. Simplify.

a. $-7.5 + 8.3 - (-4.9)$

b. $13.8 + (-9.2) - 5.5$

c. $-3.27 - 6.45 + 2.92$

C −6.8 S 5.7 T −5.4 A −0.9

9. Simplify.

a. $2n + 7 - 7n$

b. $-n - 6n + 5$

c. $-9 - (-14n) + 7 - 5n$

d. $8 - 10n - (-3n) + (-1)$

F $9n - 2$ I $-7n - 2$ A $-7n + 5$ B $-5n + 7$ S $-7n + 7$

10. Simplify.

a. $2x - 11y + 2x + 5y$

b. $-7x - (-3x) + 3y - 8y$

c. $-x - y - (-6y) - 8x$

d. $4y + (-4x) - 9y + 13x$

P $-4x - 5y$ F $9x - 5y$ W $4x - 6y$ G $-9x + 5y$ L $9x - 2y$

PARTNER A (left side)	TEAM NAME	PARTNER B (right side)

HOW DO YOU MAKE AN OCTOPUS LAUGH?

Simplify each expression. Partner A should do the left side and Partner B the right side. After completing each set, find matching answers. One will have a letter and the other a number. Write the letter in the matching numbered box at the bottom of the page.

SET 1	SET 1
T. $-7n + 2n + 9$	**8.** $-12n + 5n + 4$
I. $5n - (-3n) + 6$	**16.** $7n - (-2n) + 8$
E. $4 - n - 6n$	**10.** $9 - n - 4n$
S. $16n + 5 + (-7n) + 3$	**5.** $11n + 5 + (-3n) + 1$

SET 2	SET 2
I. $9b + (-18) - 3b + 11$	**12.** $7b + (-22) - 5b + 7$
E. $-12b - 5 - 8 + 3b$	**6.** $-9b - 1 + 18 + 4b$
T. $7 - 7b + 10 - (-2b)$	**15.** $-10 - 14b - 3 - (-5b)$
C. $-15 + 6b + (-3b) - b$	**2.** $-7 + 13b + (-6b) - b$

SET 3	SET 3
E. $7k + 4 + 4k - 9 - 5k$	**9.** $9k - 11 + 2k - 7 - 4k$
K. $-k - (-8k) - 15 + 3k - 2$	**4.** $-k - (-5k) + 9 + 2k - 14$
N. $-5 + 12k - 16 + (-5k) + 3$	**1.** $-4 + 11k - 10 + (-17k) + 3$
G. $8 + (-3k) - 20 - 3k - (-1)$	**13.** $6 + (-3k) - 24 + 13k - (-1)$

SET 4	SET 4
I. $5x + 9y + 4 + 2x - y - 15$	**3.** $4x - 5y + 9 + 2x - y - 14$
V. $-2x + y + 6 - (-8x) - 7y + (-11)$	**14.** $-12x + y + 7 - (-x) + 9y + (-7)$
L. $-x + 4y - 7x + 8y + (-3x) - 2y$	**7.** $-x + 2y + 8x - 5y + (-6x) - 4y$
T. $9 + y - (-x) - 5 - 8y - 4$	**11.** $4 - (-7y) + 7x - 14 + y - 1$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Why Was the Nearsighted Snake Unhappy?

Simplify the expression. Write the letter of the exercise in the box containing the number of the answer.

- **H** $-5 \cdot 8$
- **I** $-13 \cdot 10$
- **U** $12(-3)$
- **O** $-18(-2)$
- **S** $-4(-25)$
- **E** $-15(6)$
- **T** $\frac{1}{3}(-24)$

answers

- **21** 100
- **17** −8
- **15** −40
- **13** −70
- **10** 36
- **24** −130
- **2** −90
- **6** −36

- **I** $-9 \cdot 20$
- **D** $(-16)(-3)$
- **L** $8(-8)$
- **T** $4 \cdot 90$
- **H** $(-2.5)(-10)$
- **A** $96\left(-\frac{1}{2}\right)$
- **O** $\left(-\frac{3}{4}\right)(-12)$

answers

- **16** −48
- **26** −64
- **5** 9
- **20** −180
- **12** 360
- **22** −40
- **1** 25
- **8** 48

- **H** $-7 \cdot 2 \cdot 3$
- **T** $-5(11)(-4)$
- **R** $12(-6)(-2)$
- **F** $-1(-8)(-7)$
- **U** $(7.2)(-10)(2)$
- **G** $-2(-3)(-4)(-5)$
- **N** $\frac{2}{5}$ of -60

answers

- **4** −56
- **18** −32
- **23** 120
- **14** 220
- **11** −144
- **7** −24
- **19** −42
- **25** 144

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

- **A** $(-9)^2$
- **E** $(-3)^5$
- **I** $8(-4)^3$
- **S** $(-2)^4$
- **N** -2^4
- **D** $(-10)^2(-1)^{15}$
- **E** $\left(-10^2\right)\left(-1^{15}\right)$

answers

- **33** −100
- **39** 81
- **37** 16
- **45** −243
- **51** 100
- **46** −16
- **34** −20
- **30** −512

- **W** $2(-7)^2$
- **A** $-0.5(-0.8)^2$
- **O** $\frac{1}{4}(-10)^3$
- **F** $(-6.5)(2)(-9)$
- **R** $-1(-0.2)^3$
- **E** $\frac{3}{8}$ of 40
- **A** $(-4)(-9)\left(-\frac{5}{12}\right)$

answers

- **28** 117
- **36** −15
- **43** 0.008
- **42** −0.32
- **47** −24
- **49** −250
- **31** 15
- **35** 98

- **N** $\left(-\frac{1}{3}\right)\left(-\frac{5}{8}\right)$
- **G** $\frac{1}{6}(-6)\left(\frac{1}{7}\right)(-7)$
- **S** $\left(\frac{2}{3}\right)\left(-\frac{2}{5}\right)\left(\frac{2}{7}\right)$
- **R** $\left(-\frac{3}{4}\right)\left(-\frac{4}{3}\right)(-9)^2$
- **H** $8\left(-\frac{1}{2}\right)^3$
- **D** $6(-5)(4)(-3)(2)(-1)(0)$

answers

- **48** −1
- **41** 1
- **52** $-\frac{6}{25}$
- **29** 81
- **32** $\frac{5}{24}$
- **44** 0
- **50** $-\frac{8}{105}$

27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52

How Did Dregg Do On His Antarctica Test?

Cross out the letter pair next to each correct answer. For each letter pair that you DON'T cross out, write the uppercase letter in the box containing the lowercase letter.

Simplify.

1. $-4(-2+9)$
2. $7(-3-10)$
3. $-16(5)(-2)$
4. $12-(-3)+40$
5. $3+(-8)-17$
6. $-15(-4+1)$

g • A −22
n • V −91
c • E −85
e • P 55
k • B −28
b • Y 45
j • I 52
p • L 160

Simplify.

7. $-7-(-18)+4$
8. $(-2)(-19)(-5)$
9. $-20-(4-11)$
10. $(-5)^2(-2)^3$
11. $(14-17)^4$
12. $(-6)^2+4(-9)$

h • J −200
n • O 64
p • U 0
b • R −190
e • K −150
m • I 81
g • C 15
k • F −13

Simplify.

13. $(-2+7)(5-12)$
14. $(-4-6)(-17+1)$
15. $(-2)^5+(-5)^2$
16. $\left(-\frac{7}{8}\right)24$
17. $-\frac{4}{5}+\frac{2}{3}$
18. $\left(-\frac{4}{5}\right)\left(\frac{2}{3}\right)$

k • L 160
m • J −21
g • E −16
f • A $-\frac{2}{15}$
b • C −35
o • S $-\frac{8}{15}$
h • V −7
p • D $\frac{4}{15}$

Simplify.

19. $-2.4+4.9-(-6.8)$
20. $15.3+(-11.2)-7.5$
21. $(-0.7)^2(-10)^3$
22. $\frac{2}{9}$ of -36
23. $\frac{5}{6}-\frac{1}{3}-\left(-\frac{3}{4}\right)$
24. $\left(\frac{5}{6}\right)\left(\frac{1}{3}\right)\left(-\frac{3}{4}\right)$

h • F −490
d • B −3.4
o • D −8
k • T $-\frac{7}{12}$
b • H −9.5
f • R $-\frac{5}{24}$
m • N 9.3
q • E $1\frac{1}{4}$

Evaluate if $x = -6$, $y = 2$.

25. $4x+3y$
26. $-7xy$
27. $8x-5y$
28. $-x+9y-4$
29. xy^2
30. $(xy)^2$

a • T −58
l • A −24
f • E −18
h • W 120
i • S 84
o • R 144
q • D 20
m • C −32

Evaluate if $a = -7$, $b = -4$.

31. $-a-5b+12$
32. $(a+b)(a-b)$
33. $-2a+15b$
34. $-ab-9$
35. a^2+b^2
36. $(a+b)^2$

d • S 33
f • N 84
a • T 121
i • F −46
l • S 65
q • E 39
o • L −52
j • O −37

a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q

What Do Large Circus Animals Wear To Keep Their Legs Warm?

Simplify the expression. Cross out the letter next to each correct answer. When you finish, the answer to the title question will remain.

1-12
$30x + 10$
$-2x - 15$
$4x - 15$
$40x - 11$
$16x - 8$
$64x - 3$
$4x - 8$
$20x - 65$
$26x + 15$
$40x + 10$
$6x - 8$
$-36x + 8$
$16x - 3$
$64x + 15$
$-2x - 41$
$-22x + 66$

GEATHONDUMLTORST

13-24
$-56a$
$-9a + 7$
$-23a + 72$
$a - 6$
$-2a - 6$
53
a
$36a + 87$
$-9a + 72$
$-34a - 25$
$40a - 4$
$36a - 50$
$13a - 48$
$-2a - 50$
$-a + 7$
$2a + 87$

LBEIGOTLEGRUPSIT

1. $5(4x - 13)$

2. $-4(9x - 2)$

3. $7x - 3(5 + x)$

4. $2x - 6(4x - 11)$

5. $5 + 8(8x - 1)$

6. $-9 + 2(-x - 16)$

7. $3(12x + 5) - 10x$

8. $-5(1 - 6x) + 15$

9. $\frac{1}{3}(9x - 24) + x$

10. $7 - \frac{3}{4}(-8x + 20)$

11. $4x + 4(9x - 2) - 3$

12. $10x - 3(7 - 2x) + 18$

13. $11 + 6(-5a - 6) - 4a$

14. $15 - 2(4 + 7a) + 5a$

15. $-3a + 8 - 8(7 - 2a)$

16. $-1 + 99a + 9(6 - 11a)$

17. $4a - 4(15a - 2) - 8$

18. $-7(-2 - 5a) + 5a - 18$

19. $3(4a + 9) - 10(a - 6)$

20. $6(-3a + 12) + 8a - 13a$

21. $-2(9 + 2a) - 8(4 - 5a)$

22. $9 - 4(-a + 9) + 3(7 - 2a)$

23. $6 - \frac{1}{5}(20a - 5) + 3a$

24. $-7a + \frac{2}{3}(12a + 15) - 10$

Why Did Time Seem To Go Quickly at the Glue Factory?

Simplify the expression, then evaluate it for the given value of the variable. Find the simplified expression in the answer column. Write the letter of the simplified expression in the box that contains the value of the expression.

1. $-2x + 7 + 9x - 4$ if $x = 11$

2. $8 + 3x - (-5x) + 11$ if $x = -2$

3. $x - 12 + (-6x) - 1$ if $x = -8$

4. $-16 - 7x - x - (-5) + 2x$ if $x = 6$

5. $3(x - 4) + 10x$ if $x = -1$

6. $8x - 5(x + 6) - 8$ if $x = 20$

7. $15 - 2(7 - x) + 4x$ if $x = -9$

8. $12 - 3n + 4(2n + 5)$ if $n = 14$

9. $2n - 7(8 - 3n) + 6$ if $n = 3$

10. $-n + 9(-2n - 11) - 4$ if $n = -5$

11. $20\left(\frac{1}{5}n - \frac{3}{4}\right) + 9n$ if $n = -4$

12. $8 - \frac{2}{3}(6 - 15n) + n$ if $n = 7$

13. $n(n + 7) - 16n$ if $n = 10$

14. $10 - n(3n - 4) - n^2$ if $n = -3$

Simplified Expressions

I. $-5x - 13$
E. $13x - 38$
S. $6x + 1$
T. $7x + 3$
S. $-6x - 11$
A. $3x - 38$
R. $6x - 12$
A. $8x + 19$
E. $13x - 12$
N. $3x + 1$

A. $23n - 50$
S. $-4n^2 + 4n + 10$
L. $2n^2 - 7n$
P. $11n + 4$
W. $-19n - 103$
E. $13n + 4$
T. $5n + 32$
F. $n^2 - 9n$
S. $11n - 103$
T. $13n - 15$

27	102	96	−8	3	−53	−59	10	22	−47	−67	13	81	19	−38	80	−25

What Did Dr. Smartz Say To the Guy Who Had Been Attacked By a Vicious Eight-Foot-Tall Cockroach?

Write the letter of the exercise in the box containing the answer. Answers for the top half of the page are in the top row of boxes. In each row of boxes, the answers are arranged from smallest to largest.

Simplify the expression.

T. $\frac{-40}{-5}$

I. $-160 \div 8$

E. $\frac{75}{-15}$

S. $-360 \div (-4)$

H. $\frac{-72}{-18}$

E. $66 \div (-11)$

S. $\frac{-210}{7}$

T. $5 \div \frac{1}{2}$

E. $\frac{-60 + 15}{-3}$

S. $\frac{-23 - 7}{15}$

R. $\frac{5(-8)}{-2}$

Y. $\frac{-100 + (-100)}{4}$

T. $\frac{-270}{-10} + \frac{-270}{10}$

E. $\frac{8(-9)(5)}{3(-2)}$

S. $\frac{36}{-9} + \frac{-36}{9}$

A. $\frac{90 - (-1)}{-2 + 15}$

E. $\frac{(-12)^2}{-4}$

T. $\frac{3(-2)^5}{8}$

H. $\frac{-2(63)}{7 - 16}$

M. $1 \div \left(-\frac{1}{3}\right)$

−50	−36	−30	−24	−20	−12	−10	−8	−6	−5	−3	−2	−1	0	4	7	8	9	10	14	15	20	60	90

Simplify the expression.

T. $\frac{49}{-7} + \frac{-16}{4}$

A. $810 \div (-9)^2$

U. $\frac{(-2)(8)(-3)}{-12}$

N. $-10 \div \left(-\frac{1}{8}\right)$

G. $\frac{(4)(-7) + (-4)(-7)}{720}$

A. $\frac{-10 - (-90)}{-2}$

O. $\left(\frac{-60}{15}\right)^2$

N. $\frac{-63}{-9} + \frac{32}{-16}$

A. $\frac{-9 \cdot 9 - 9}{5}$

D. $\frac{(-10)^3}{-10}$

Y. $\frac{7 + 4 \cdot 5}{-3}$

G. $\frac{-2^6}{-8}$

Evaluate if $a = -8$, $b = -3$.

I. $\frac{3a}{2b}$

U. $\frac{5ab}{4}$

N. $\frac{ab^2}{2}$

G. $\frac{-10}{-a + b}$

Solve mentally.

B. $5x = -35$

O. $-12p = -36$

R. $60 \div n = 5$

S. $60 \div (-n) = 5$

−40	−38	−36	−18	−12	−11	−9	−8	−7	−4	−2	−1	0	3	4	5	8	9	10	12	16	30	80	100

Why Did Santa Claus Go To a Self-Esteem Workshop?

Simplify the expression. Write the letter of the answer in the box containing the number of the exercise. If the answer has a ●, shade the box instead of writing a letter in it.

1. $3 + (-8)$
2. $3(-8)$
3. $36 - (-9)$
4. $\frac{36}{-9}$
5. $15 + (-2) + 4$
6. $-11 \cdot 6 \cdot 5$
7. $-20 - (8 - 9)$
8. $\frac{5(-12)}{-7 - 8}$

answers

N 17
E −19
● −4
S 6
E −5
L −330
O 45
● 4
I −24

17. $-6 - 11 + 2$
18. $8(-10)(-3)$
19. $17 - (-4) - 4$
20. $\frac{-36}{-18} - \frac{-60}{12}$
21. $-100 - (-90) + (-80)$
22. $(-1)^4(-15)^2$
23. $7 + (-10) - 7 - (-10)$
24. $\frac{6 \cdot 25}{-5 \cdot 3}$

answers

M 225
I −15
E −10
F 17
N −90
T 275
E 240
● 7
B 0

9. $-16 + 5 + (-2)$
10. $(-4)^3$
11. $(9 - 2) - (2 - 9)$
12. $\frac{100}{-25} + \frac{-100}{-20}$
13. $-45 + (-90) + (-45)$
14. $(-4 \cdot 3) + (-5 \cdot 4)$
15. $-7 - (-10) - 7$
16. $\frac{-12^2}{-9}$

answers

O −64
● −4
D 1
I −13
E −32
R 16
E 14
● −8
H −180

25. $-14 - (-11) + 30$
26. $(-16)(-5) + (90)(-4)$
27. $7 - 17 - (-4) + (-1)$
28. $\frac{(-10)^3}{8}$
29. $-2 - (-5) + (-2) + 5 - (-2)$
30. $5(-2)^5$
31. $2 - 5 - (-2) + (-5) - 2$
32. $\frac{(-5)(2) + (-5)(-2)}{25}$

answers

V −160
R −10
H −125
L 0
● −280
S −8
G 8
N 27
L −7

13	7	20	25	3	15	27	10	5	29	1	16	8	23	11	32	2	18	30	14	12	26	17	21	4	28	9	22	31	24	6	19

Did You Hear About . . .

1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22 ?

Simplify the expression. Then write the word next to the correct answer in the box containing the exercise number.

1. $-5 + (-16) + 9$

2. $-4(3 - 10)$

3. $\frac{36}{-4} + \frac{-60}{12}$

4. $-15 - (-4) - 7$

5. $\frac{-18 - 12}{-18 + 12}$

6. $2(-5)^3$

7. $\left(\frac{3}{8}\right)\left(\frac{8}{3}\right)(-83)$

8. $-10 + 3(-4)(-5)$

9. $\frac{1}{4}(-8)^2$

10. $11(-4) + (-16)(-3)$

11. $\frac{74 - (-3)}{13 + (-20)}$

12. $(-3)^4(-1)^7$

13. $\frac{-5 - (-44)}{-2 + 15}$

14. $-7(-8)(-9)(-10)$

15. $\left(\frac{2}{7}\right)\left(\frac{1}{3}\right)\left(-\frac{4}{5}\right)$

16. $5 + (-2) - 7 - (-18)$

17. $\frac{3}{4}$ of -60

18. $(-8 - 11) - (8 - 11)$

19. $\frac{-490}{-49} + \frac{-490}{10}$

20. $(-0.6)^2(-10)^3$

21. $\frac{(11 \cdot 4) - (-5 \cdot 12)}{-2}$

22. $-\frac{1}{4} + \frac{3}{5} - \frac{7}{10}$

Answers 1-11

- −250 • THE
- −9 • CHAPTER
- 50 • TO
- −12 • THE
- −25 • WROTE
- −14 • WHO
- 4 • FIFTH
- −83 • THIRD
- 28 • WRITER
- 44 • UP
- −11 • FLOOR
- 5 • FROM
- −22 • THAT
- 16 • THE
- −18 • MOVED
- 7 • EIGHTH

Answers 12-22

- −241 • WHEN
- 14 • OF
- $-\frac{8}{85}$ • HAVING
- −52 • OLD
- 5040 • WAS
- −360 • SAME
- −13 • WITH
- −45 • WORKING
- −81 • BECAUSE
- $-\frac{8}{105}$ • TIRED
- −42 • WRITING
- −39 • THE
- $-\frac{7}{20}$ • STORY
- 3 • SHE
- −16 • ON
- $-\frac{9}{20}$ • BOOK

How Did Superman's Girl Friend Do in Math Class?

Simplify the expression and find your answer in the adjacent answer set. Write the letter of the answer in the box containing the exercise number.

	Answers 1–3	
1 $9x - (4x + 3)$	**V** $-6x + 7$	**O** $5x - 3$
2 $2x - (8x - 1) - 15$	**E** $-5x + 7$	**P** $-5x - 14$
3 $-(6x - 11) + x - 4$		**S** $-6x - 14$

	Answers 4–6	
4 $5n + 2n - (3 - 10n)$	**I** $-8n - 13$	**C** $20n - 3$
5 $16n - (-5 - 4n) + 8$	**H** $17n - 3$	**E** $20n + 13$
6 $-(9n - 2) - 15 - (-n)$		**K** $-10n - 4$

	Answers 7–9	
7 $(7u + 10) - (3u - 12)$	**A** $4u + 22$	**E** $-29u - 36$
8 $-u + 5u - 2(6u - 11)$	**T** $-25u - 30$	**L** $-8u - 36$
9 $20 - 7(3u + 8) + (-8u)$		**S** $-8u + 22$

	Answers 10–12	
10 $9(x - 2y) - (5x + 4y)$	**H** $-5x + 7$	**L** $-5x - 22y$
11 $-(7x - 10y) - 3(4x + 9y)$	**S** $-16x + 7$	**G** $-19x - 17y$
12 $7 + 2(-8x + y) - (-11x + 2y)$		**T** $4x - 22y$

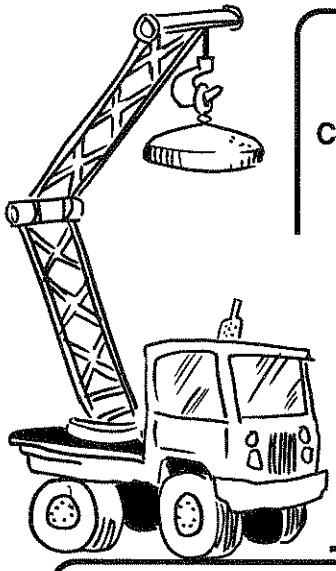
	Answers 13–15	
13 $3a - 8(2a + 5b) - (a - 7b)$	**M** $-12a + 10b$	**G** $-14a - 33b$
14 $16a - 5b - (-6a - 15b) - (-4b)$	**D** $22a + 14b$	**O** $-21a + 10b$
15 $-4(9a - b) + 3(5a + 2b)$		**N** $-16a + 9b$

	Answers 16–18	
16 $x(x + 8) - (5x^2 + 3x)$	**N** $9x^2 + 22x$	**L** $-4x^2 + 22x$
17 $7x - 3(2x^2 - x) + 15x^2$	**T** $-4x^2 + 5x$	**E** $-8x^2 + 15x$
18 $2x(9 - 5x) - (-4x - 6x^2)$		**R** $9x^2 + 10x$

8	12	3	13	1	16	10	4	9	18	15	6	2	11	17	7	14	5

If Your Car Breaks Down, Why Should You Call a 24-hour Wrecker?

Use the code key in the box below to write the appropriate letter next to each equation or statement. Then write that letter in the box containing the number of the exercise.



CLOSURE PROPERTIES:	**(I) closure property of addition**
	(L) closure property of multiplication
COMMUTATIVE PROPERTIES:	**(Y) commutative property of addition**
	(H) commutative property of multiplication
ASSOCIATIVE PROPERTIES:	**(S) associative property of addition**
	(W) associative property of multiplication
IDENTITY PROPERTIES:	**(N) identity property of addition**
	(O) identity property of multiplication
INVERSE PROPERTIES:	**(R) inverse property of addition**
	(A) inverse property of multiplication
DISTRIBUTIVE PROPERTY:	**(E)**
THE STATEMENT IS FALSE:	**(T)**

1. $xy + 7 = 7 + xy$	**13.** $15 + (k + 4) = 15 + (4 + k)$
2. $xy + 7 = yx + 7$	**14.** $15 + (4 + k) = (15 + 4) + k$
3. $7(x + y) = 7x + 7y$	**15.** $15 - (4 - k) = (15 - 4) - k$
4. $-4 + 4 = 0$	**16.** If a and b are rational numbers, then ab is a rational number.
5. $\frac{1}{9}(9) = 1$	**17.** $\left[-6 \cdot \left(-\frac{1}{6}\right)\right]n = 1 \cdot n$
6. $u + (u + 20) = (u + u) + 20$	**18.** $8a + ab = a(8 + b)$
7. $5(8n) = (5 \cdot 8)n$	**19.** $w(16w) = w(w \cdot 16)$
8. If a and b are rational numbers, then $a + b$ is a rational number.	**20.** $w(w \cdot 16) = w^2 \cdot 16$
9. $w + 0 = w$	**21.** $3x + [10 + (-10)] = 3x + 0$
10. $w \cdot 1 = w$	**22.** $\frac{2}{5} \cdot \frac{5}{2}x^3 = 1 \cdot x^3$
11. $x(x - y) = x^2 - xy$	**23.** $1 \cdot x^3 = x^3$
12. $x(x \cdot y) = x^2 \cdot xy$	**24.** $3(m \div 12) = 3(12 \div m)$

12	19	3	13	5	21	11	22	16	7	17	1	14	23	9	15	2	18	8	4	24	10	20	6

Books Never Written

- *What's That Smell?*

by

6	11.5	15	−9	17	3	13	7.6	−9	45	−11	17

- *Too Sick For School*

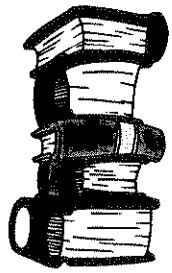
by

−5.4	15	11	17	−14	−47	−27	16	−15

- *My Talking Alarm Clock*

by

−9	32	45	−8.1	45	7	9.9	−6	21	16



Find the solution in the code. Each time it appears, write the letter of the exercise above it.

P $x + 2 = 9$	**I** $n + 7 = -20$	**O** $10 + y = 4$
E $q - 5 = 12$	**G** $d - 1 = -16$	**D** $-10 + y = 3$
H $6 + m = 27$	**A** $b - 40 = -25$	**C** $-11 + x = -5$
Y $t - 14 = -3$	**M** $18 + w = 7$	**K** $-13 + a = -60$
J $u - 7.5 = 2.4$	**L** $k + 8.3 = 19.8$	**F** $-5.2 + n = -10.6$
N $21 = y + 5$	**R** $-12 = h - 3$	**U** $7 = -38 + p$

What Do You Call It When a Royal Ruler Climbs a Mountain?

Solve, then cross out the letter above the solution. When you're finished, the answer to the title question will remain.

1. $n - 3 = 10$

2. $y + 8 = 15$

3. $9 + x = 2$

4. $d - 16 = -5$

5. $-6 + u = 22$

6. $a + 11 = -14$

7. $18 = k + 1$

8. $7 = p - 12$

9. $-3 = b + 60$

10. $11 - (-x) = 44$

11. $-5 - (-m) = 92$

12. $y - (-27) = 4$

13. In 3-way light bulbs, the highest wattage is the sum of the two lower ones. If the lowest is 60 watts, and the highest is 150 watts, what is the middle wattage?

14. It was an extremely cold day on the mountain. The temperature dropped 22° to −13° F. What was the temperature before the drop?

S	T	H	E	A	J	B	I	G	O	U	M	P	T	H	O	E	N
17	−23	88	9°F	11	13	33	−32	5°F	90 W	19	7	−25	97	75 W	−7	28	−63

15. $3 + 8 + x = 50$

16. $-7 + v + 15 = -2$

17. $10 + q - 3 = 6 \cdot 5$

18. $3 \cdot 16 = -9 + k$

19. $-8 = 12 + t - 5$

20. $43 + 7 + x - 16 = 0$

21. $d - \frac{1}{5} = \frac{3}{5}$

22. $-\frac{3}{8} + n = -\frac{7}{8}$

23. $\frac{2}{3} = b - \frac{1}{4}$

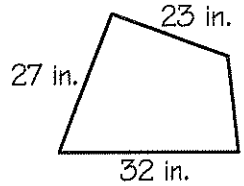
24. $x - (-30) = 100 - 9$

25. $2m + 7 - m = -40$

26. $0 = -3y - 10 + 4y$

27. The sum of the angle measures of any triangle is 180°. If one angle of a triangle measures 35° and another angle measures 72°, what is the measure of the third angle?

28. The perimeter of this quadrilateral is 100 in. What is the length of the side not given?



S	U	O	N	K	E	S	E	W	I	T	N	O	U	P	G	E	T
−34	−10	−47	18 in.	68°	$-\frac{1}{2}$	39	57	73°	15 in.	$\frac{11}{12}$	53	10	−15	$\frac{4}{5}$	$-\frac{1}{6}$	61	23

MOVING WORDS

Solve each equation in the top block and find the solution in the bottom block. Transfer the word from the top box to the corresponding bottom box. You'll get a "high five" for a high five.

THE $11x = 99$ 1	**TO** $-4x = 36$ 2	**A** $\frac{x}{5} = 8$ 3	**OF** $\frac{x}{-3} = 12$ 4
BECAUSE $-15x = -75$ 5	**WHO** $\frac{x}{-2} = -72$ 6	**HAS** $18x = 180$ 7	**FREE** $\frac{-x}{4} = 25$ 8
THE $\frac{x}{300} = -2$ 9	**QUINT** $45x = -360$ 10	**CONGRATULATIONS** $-\frac{n}{6} = 20$ 11	**AIRLINE** $-12n = -144$ 12
GOT $42 = 14n$ 13	**PROGRAM** $16 = \frac{n}{16}$ 14	**TICKETS** $490 = -7n$ 15	**MOTHER** $-50 = \frac{n}{-9}$ 16
PLANE $\frac{-n}{80} = -30$ 17	**FREE** $25n = -1000$ 18	**QUINTUPLETS** $-\frac{n}{13} = 40$ 19	**FLYER** $-99n = 0$ 20

$n = -120$	$x = -9$	$x = -600$	$n = 450$	$x = -36$
$n = -520$	$x = 144$	$n = 3$	$x = -100$	$n = 2400$
$n = -70$	$x = 5$	$x = 9$	$n = 12$	$x = 10$
$x = 40$	$n = -40$	$x = -8$	$n = 0$	$n = 256$

Famous Honolulu Keyboarding School

Cross out the letter pair next to each correct solution. For each letter pair that you DON'T cross out, write the uppercase letter in the box containing the lowercase letter.

1 $-5y = 80$ **2** $-36 = -18d$ **3** $9x - 6x = 36$ **4** $49 \cdot 2 = 3a - 10a$

5 $\frac{w}{4} = -16$ **6** $\frac{1}{4}b = 16$ **7** $-\frac{1}{9}d = 12$ **8** $-3 = \frac{-e}{75}$

9 Ken is thinking of a number. The product of the number and 7 is –350. Find Ken's number.

10 Barbie has a favorite number. The quotient of her number and –4 is –90. What is Barbie's favorite number?

Answers 1-10 **e•F** –14 **a•S** –16 **d•R** 225 **c•H** 58 **b•J** 64 **n•Y** –9
m•V –50 **i•A** 290 **j•T** –108 **g•O** 12 **f•D** 360 **l•N** 2 **h•P** –64

11 $2.5x = -60$ **12** $-\frac{1}{5}n = -14$ **13** $70.5 = 9.4p$ **14** $-20 = \frac{1}{16}y$

15 $\frac{2}{3}k = 10$ **16** $\frac{3}{8}u = -15$ **17** $\frac{7}{2}a = 35$ **18** $-\frac{5}{16}t = -45$

19 Argyle sells computers. He keeps one eighth of his sales as a commission. How much must he sell to earn $500?

20 The area of a TV screen is 576 square inches. If the width of the screen is 32 in., what is the height?

Answers 11-20 **a•S** –40 **j•C** 70 **e•C** –50 **h•A** 10 **b•R** 18 in. **m•E** $3600
d•A 24 in. **f•L** –320 **k•T** 144 **l•G** 15 **n•E** –24 **g•C** 7.5 **o•N** $4000

21 $-0.3m = -12$ **22** $36 = -\frac{9}{5}d$ **23** $x - 5x = 8^2$ **24** $\frac{1}{6}y = \frac{1}{3}$

25 $-\frac{2}{5}w = -\frac{4}{15}$ **26** $\frac{1}{2} = 8m$ **27** $\frac{4}{3}b = -\frac{20}{3}$ **28** $x - \frac{9}{10}x = 7$

29 Lisa is 14 years old. Her age is two sevenths of her father's age. How old is Lisa's father?

30 Eon runs a music store. He sells CD's for 1.6 times what he pays for them. If Eon sells a CD for $15.20, how much did he pay for it?

Answers 21-30 **h•O** 49 **b•W** $\frac{3}{8}$ **j•R** –16 **c•T** 40 **l•D** 2 **g•E** $9.50
k•I –20 **a•N** $\frac{2}{3}$ **o•S** –5 **f•H** $\frac{1}{16}$ **f•K** 52 **b•S** 70 **l•K** $8.80

a	b	c	d	e	f	g	h	i	j	k	l	m	n	o

What Did Dr. Freud Say To the Guy Who Thought He Was Mickey Mouse One Day and Donald Duck the Next?

Solve the equation, then find your solution in the corresponding answer boxes. Write the letter of the exercise in the box containing the answer.

A $8 + x = 40$	**I** $\frac{a}{5} = -16$	**O** $y - 17 = -4$
E $-9b = -99$	**G** $-3 = k + 75$	**A** $-\frac{1}{8}w = -13$
N $-11 + m = 50$	**U** $65 = 2x - 7x$	**H** $10 - (-d) = 3$
Y $\frac{4}{5}b = 12$	**R** $15 + u - 22 = 9^2$	**V** $9n = \frac{1}{4}$

15	13	−13	$\frac{1}{12}$	32	88	11	75	−7	104	$\frac{1}{36}$	−80	61	−78

S $-5 = \frac{-a}{36}$	**E** $p - (-1) = (-7)^2$	**L** $30 = -12y$
I $w - \frac{2}{9} = \frac{5}{9}$	**S** $-\frac{5}{8}x = 30$	**Y** $-2 \cdot 7 = -3 + t + 24$
E $-4.5q = -32.4$	**S** $-4c - 9.6 + 5c = 0$	**L** $-\frac{3}{4}m = -\frac{9}{16}$
D $18 = b + 5^3$	**P** $n - \frac{1}{3} = \frac{2}{5}$	**N** $8x - 9x = \frac{150}{10}$

$\frac{5}{8}$	−107	$\frac{7}{9}$	9.6	−15	48	−35	−92	180	$\frac{11}{15}$	7.2	$\frac{3}{4}$	−2.5	−48

How Much Did Captain Hook Have to Pay for His Earrings?

For each problem, label a variable (let x = the unknown), then write and solve an equation. Find your equation in the column at the right. Write the letter of the equation in the box at the bottom that contains the problem solution.

1 Ben and Jerry together scored 50 points in the big game. If Ben scored 16 points, how many points did Jerry score?

2 Marble Middle School paid $500 for 16 graphing calculators. What was the cost for each calculator?

3 On first down, a football team lost 16 yd. After two downs, the team had an overall gain of 5 yd. How many yards were gained on second down?

4 One sixth of the candies in a bag of M&M's are orange. If there are 15 orange candies, how many M&M's are in the bag?

5 A scuba diver dove 16 ft to an elevation of −50 ft. What was her elevation before the dive?

6 The number of elephants at the circus was two fifths of the number of horses. If there were 16 elephants, how many horses were there?

7 A chest was resting on the ocean floor 500 ft below the surface. It was lifted to the deck of a ship 16 ft above the surface. How far was the chest lifted?

8 If you divide the age of Grampa Gump by 16, you get the age of Junior Gump. If Junior is 5 years old, how old is Grampa?

9 At Maxx Middle School, there are 30 times as many students as teachers. If there are 450 students, how many teachers are there?

10 Kodak cut a pizza into eight equal slices and ate three of them. If his meal had 450 calories, how many calories were in the entire pizza?

equations

R $30x = 450$

S $x - \frac{1}{6} = 15$

E $x + 16 = 50$

U $\frac{2}{5}x = 16$

C $-16 + x = 5$

T $\frac{30}{x} = 450$

B $\frac{3}{8}x = 450$

A $16x = 500$

K $\frac{x}{16} = 5$

A $x - 16 = -50$

O $x \div \frac{2}{5} = 16$

N $\frac{1}{6}x = 15$

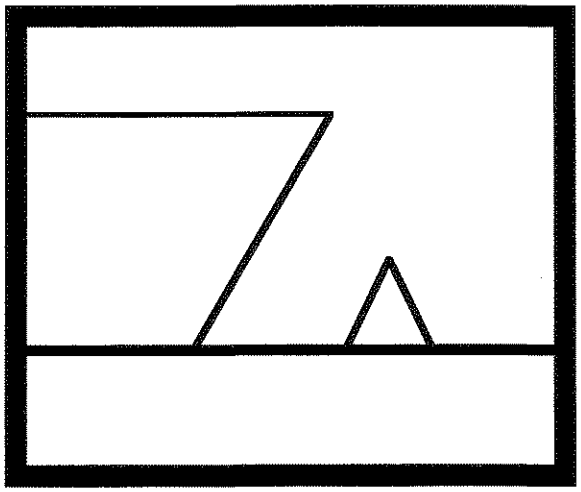
L $8x - 3x = 450$

A $-500 + x = 16$

25 yd	$31.25	486 ft	1200 cal	40	21 yd	80	32	516 ft	90	960 cal	34	−34 ft	15	$34.75

WHAT IS THE TITLE OF THIS PICTURE?

Find each solution in the coded title. Each time it appears, write the letter of the exercise above it.



CODED TITLE:

135	−65	−2	−98	−9	48	−14	−14	−2	7	−2	−8	105
−81	60	60	−17	104	48	−81	−3	−72	−81	60	5	135	48	7	−3
48	122	11	−14	60	144	−8	−2	−8	105	43	144	−2	−81	−12	−65

V $5x + 8 = 43$ **A** $2n - 15 = 81$ **C** $-9a + 4 = 112$ **N** $-3 + 10y = -83$

O $\frac{w}{4} + 7 = 22$ **T** $\frac{x}{9} - 1 = -10$ **L** $\frac{d}{-8} + 37 = 24$ **P** $11 - \frac{k}{2} = 60$

E $-5 - 16y = 43$ **G** $\frac{-u}{7} + 2 = -13$ **D** $15 - 8m = -73$ **S** $\frac{1}{3}x + 10 = 55$

R $7t - 18 = -116$ **H** $-\frac{1}{5}q - 4 = 9$ **I** $72 + 36n = 0$ **W** $7 - \frac{1}{16}x = -2$

What Do You Get When You . . .

1 Cross a fast dog with a bumblebee?

−16	−12	30	315	2	36	−15	15	−42	−18	−40	44	56	−42	−5	−5

2 Cross an airplane with a magician?

−16	98	−2	7	36	−27	−18	30	295	8	15	315	168	2	315	2	315

Solve each equation or problem and find your solution in the code. Each time the solution appears, write the letter of the exercise above it.

S. $2 + 9n = 74$

E. $-18y + 7 = -29$

H. $11 - 4d = 71$

C. $-8 + \frac{x}{7} = 16$

I. $-\frac{1}{3}p + 1 = 10$

U. $15 - \frac{w}{6} = 22$

G. $\frac{2}{5}y + 8 = 20$

A. $-12 + 5k = -92$

D. $-\frac{3}{8}x - 11 = 4$

F. $-28 = 13q - 2$

O. $30 = 10 + \frac{4}{3}m$

L. $-48 = -6y - 6$

B. $8 - \frac{5}{7}x = -32$

Z. $65 + 13t = 0$

N. $100 = 1 - \frac{11}{2}n$

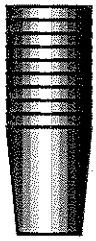
Y. Mr. Mustard said: "Eight less than three times my age is 100." How old is Mr. Mustard?

R. You are a salesperson for Acme Toys. Every day you earn $30 plus two ninths of your sales. What dollar amount of sales do you need today to earn $100?

Why Did the Snorgs Name Their Only Daughter "Margarine"?

Solve the equation. Write the letter of the answer in the box containing the exercise number. Then rearrange each set of letters to make a word.

1. $2x + 3 = 12$
2. $6y - 5 = 11$
3. $-\frac{1}{8}d + 7 = 16$
4. $11 - \frac{a}{4} = 4$
5. $\frac{2}{3}k + 8 = 18$
6. $\frac{5}{2}x - 1 = -31$
7. Karma's age is 2 years less than three eighths of her father's age. If Karma is 13 years old, how old is her father?
8. $\frac{2}{3}w = 7$
9. $\frac{3}{4}x - 2 = 8$
10. $\frac{7}{2}m + 1 = -10$
11. $4 - \frac{8}{3}q = 19$
12. $-78 = 10b - 3$
13. $20 + \frac{4}{5}y = 8$
14. Last week Kiwi filled his 16-gallon tank with gas. On the average, his car burns 0.03 gallon of gas per mile. If Kiwi has 4 gallons left in his tank, how many miles has he driven?
15. $\frac{11}{4}p + 3 = 5$
16. $\frac{x}{18} + 8 = -2$
17. $6 - \frac{3}{7}h = 11$
18. $-4 = 12t - 13$
19. $80 + \frac{5}{16}y = 100$
20. $2n - 3n = \frac{2}{9}$
21. The drawing shows a stack of paper cups. The cups are 10 cm high. Each cup after the first adds 0.8 cm to the height of the stack. How many cups will fit in a dispenser that is 30 cm high?



Answers 1-7

L -10	D 40	H $2\frac{2}{3}$
O 15	T 28	R 36
E $4\frac{1}{2}$	T -12	Y -72

Answers 8-14

H $-5\frac{5}{8}$	S 360	N -15
N $10\frac{1}{2}$	V $-7\frac{1}{2}$	E $13\frac{1}{3}$
Y 400	A $-3\frac{1}{7}$	O -9

Answers 14-21

R $-\frac{2}{9}$	A $\frac{8}{11}$	U -180
N $1\frac{1}{8}$	E 64	H 26
B $\frac{3}{4}$	S 36	T $-11\frac{2}{3}$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

Rearrange each set of letters to make a word. Write the word in the set of boxes below.

Did You Hear About . . .

1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	???

Solve each equation or problem. Write the word next to the correct answer in the box that contains the exercise number.

Answers 1-9

- $-\frac{2}{5}$ • WHO
- −92 • TRIED
- $-3\frac{1}{3}$ • BRAIN
- 32 • FROM
- $7\frac{1}{2}$ • THE
- $-2\frac{5}{6}$ • SLEEP
- −100 • WOKE
- 28 • DREAMING
- $-1\frac{1}{4}$ • GUY
- $5\frac{2}{3}$ • HIS
- $4\frac{1}{4}$ • SURGERY
- 75 • UP
- $3\frac{1}{2}$ • TRANSPLANT

Answers 10-17

- −90 • MISSING
- $10\frac{3}{4}$ • HE
- $-\frac{5}{8}$ • CHANGED
- $-\frac{1}{4}$ • DECIDED
- −96 • OPERATION
- 64 mi • MIND
- −48 • WITH
- 15 • SAID
- 62 mi • INTO
- −15 • HAD
- 57 mi • HIS
- 72 mi • SKULL
- −50 • AND

1 $2n + 5 = 20$

2 $8y - 3 = -13$

3 $12 - 5b = 14$

4 $\frac{1}{4}m + 9 = -16$

5 $2 - \frac{x}{15} = -3$

6 $\frac{5}{8}a - 27 = -7$

7 $7x - 11 - 4x = 6$

8 $32 = y - 8 - 13y$

9 $-10 = -12 + \frac{4}{7}n$

10 $4 \cdot 9 = 30 - \frac{k}{16}$

11 $\frac{d + 8}{3} = -14$

12 $-\frac{1}{5}p + \frac{9}{5}p + 6 = 30$

13 $\frac{4m - 7}{2} = 18$

14 $10 + x - \frac{1}{3}x = 0$

15 $5 = \frac{15 - 24a}{6}$

16 So far, 37 miles of a new highway have been completed. This is one mile less than two thirds of the entire length. How long will the new highway be when complete?

17 Buck rented a truck for $39.95 plus $0.32 per mile. Before returning the truck, he filled the tank with gasoline, which cost $9.80. If the total cost was $70.23, how far was the truck driven?

What Do You Call an Arrow With No Arrowhead?

Solve each problem and find your answer in the answer section. Look for the letter of the correct answer in the string of letters near the bottom of the page and cross it out each time it appears. When you finish, write the remaining letters in the space at the bottom of the page.

1 Jack is thinking of a number. Eight more than the product of 5 and the number is 93. Find Jack's number.

2 Jill is thinking of a number. Twenty less than one fourth of the number is –45. Find Jill's number.

3 Papa John is 50 years old. His age is 2 years more than 3 times the age of Jimmy John. How old is Jimmy?

4 Jennifer weighs 99 lb. Her weight is 5 pounds less than two thirds of her father's weight. How much does her father weigh?

5 The Backpacking Club is having some posters printed. The printer charges $180 plus $2.50 per poster. How many posters can be printed for $1000?

6 Zolox worked 38 hours last week. He had $88 deducted from his earnings for taxes. If he had $273 left after the deduction, how much does Zolox earn per hour?

7 Mega Middle School had a Valentine Dance. Four fifths of the students plus 7 teachers were there. If there were 495 people at the dance, how many students attend the school?

8 Romeo ordered a bouquet of roses for his girl friend. Each rose cost $2.95, and the delivery charge was $8.50. If the total cost was $61.60, how many roses did Romeo order?

9 The temperature in Frostport is 8°F and dropping at the rate of 3.5 degrees per hour. How many hours will it be until the temperature is –20°F?

10 Sky High School ordered two laser printers plus a supply of toner cartridges for them. Each printer cost $675, and each cartridge cost $80. If the total cost was $2310, how many cartridges were ordered?

answers

N 740	C 17			L 164 lb	A 8 h
T 6 h	O –96	D 610	H 16	S 372	M $9.50
K 156 lb	F 18	U 328	R 12	G –100	P 14

D G R K U P A C O R F I N D A T H L G F U E R M S A S H

answer to puzzle:

TEAM NAME: _____ PARTNER A: _____

Why Shouldn't You Let a Doctor Put One of Those Wooden Sticks In Your Mouth?

Cross out the letters above each correct answer. When you finish, write the remaining letters in the spaces at the bottom of the page.

1. Ms. Gadget's car broke down on the turnpike. Acme Towing charged $30 plus $3 per mile to tow the car. If Ms. Gadget paid $162, how far was the car towed?

2. Working as a waiter, Michael earns $6.50 per hour plus tips. Last night he received $36.50 in tips and earned a total of $65.75. How many hours did he work?

3. A banana has 80 calories. This is 5 calories less than one seventh of the calories in a banana split. How many calories are in a banana split?

4. The pressure on a scuba diver at sea level is 14.7 pounds per square inch (psi). The pressure increases 0.445 psi for each foot of depth. Suppose the pressure on a diver is 41.4 psi. How deep is she?

5. Mr. Kork sold his car for $8,400. This was $200 more than two fifths of what he had paid for the car originally. How much had Mr. Kork paid for the car?

6. A spring is 2 in. long with no weight suspended from it. For each ounce of weight, the spring stretches 0.3 in. until it reaches its maximum length of 8 in. How much weight must be added for the spring to reach its maximum length?

7. Jennifer lit a 12-inch candle and let it burn. She found that after each hour, the candle was $\frac{3}{4}$ in. shorter. If she let the candle burn until it was only 1 in. tall, how many hours did it burn?

8. As an airplane rises, the outside temperature drops 3.6°F for each 1000 feet of elevation gain. Suppose the outside temperature is 75°F on the ground when the plane takes off and −51°F at cruising altitude. How high is the plane then?

9. Snorkel and two friends rented three life jackets and a sailboat. The life jackets were $3 each and the boat was $12 an hour. The total cost was $81. For how many hours did they rent the sailboat?

IT	AT	YO	UR	UD	ID	UP	ON
$20,500	44 mi	54 ft	6 h	8.5 h	60 ft	$14\frac{2}{3}$ h	38,000 ft
TK	**CA**	**RE**	**NO**	**WW**	**SE**	**HO**	**ME**
24 oz	595 cal	20 oz	$23,800	52 mi	35,000 ft	625 cal	4.5 h

TEAM NAME:_____ PARTNER B:_____

Why Shouldn't You Let a Doctor Put One of Those Wooden Sticks In Your Mouth?

Cross out the letters above each correct answer. When you finish, write the remaining letters in the spaces at the bottom of the page.

1. Mr. Gadget's car broke down on the turnpike. Acme Towing charged $30 plus $3 per mile to tow the car. If Mr. Gadget paid $174, how far was the car towed?

2. Working as a waiter, Michael earns $6.50 per hour plus tips. Last night he received $38.50 in tips and earned a total of $74.25. How many hours did he work?

3. A banana has 90 calories. This is 5 calories less than one seventh of the calories in a banana split. How many calories are in a banana split?

4. The pressure on a scuba diver at sea level is 14.7 pounds per square inch (psi). The pressure increases 0.445 psi for each foot of depth. Suppose the pressure on a diver is 32.5 psi. How deep is he?

5. Ms. Kork sold her car for $8,700. This was $100 more than two fifths of what she had paid for the car originally. How much had Ms. Kork paid for the car?

6. A spring is 3 in. long with no weight suspended from it. For each ounce of weight, the spring stretches 0.2 in. until it reaches its maximum length of 9 in. How much weight must be added for the spring to reach its maximum length?

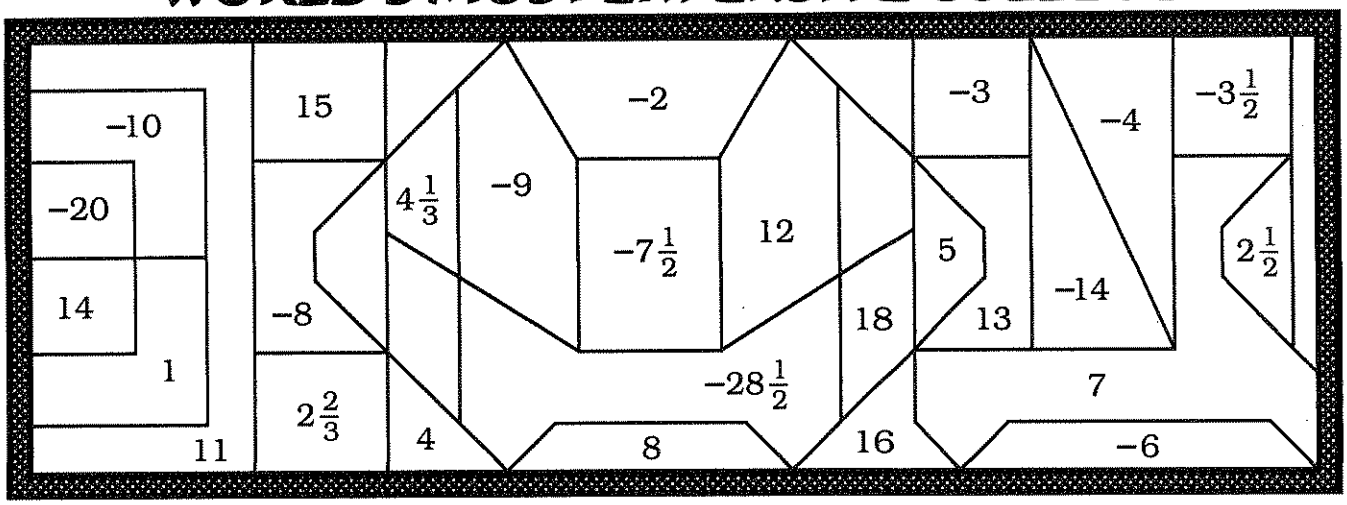
7. Jennifer lit an 11-inch candle and let it burn. She found that after each hour, the candle was $\frac{3}{4}$ in. shorter. If she let the candle burn until it was only 1 in. tall, how many hours did it burn?

8. As an airplane rises, the outside temperature drops 3.6°F for each 1000 feet of elevation gain. Suppose the outside temperature is 65°F on the ground when the plane takes off and −43°F at cruising altitude. How high is the plane then?

9. Snorkel and two friends rented three life jackets and a sailboat. The life jackets were $3 each and the boat was $12 an hour. The total cost was $93. For how many hours did they rent the sailboat?

TH	AT	OP	IN	ET	OO	HE	LP
665 cal	26 oz	7 h	48 mi	9.5 h	40 ft	$22,400	$13\frac{1}{3}$ h
AN	**IC**	**EC**	**RY**	**RE**	**ST**	**EX**	**AM**
$21,500	32,000 ft	48 ft	30 oz	635 cal	5.5 h	30,000 ft	54 mi

WORLD'S MOST EXPENSIVE COLLEGE



Shade in the area containing each solution.

1. $5x + 2(x + 4) = 64$

2. $9(y - 2) + 4 = 31$

3. $7 + 4(2a + 15) = -13$

4. $6(n - 5) - 11n = 0$

5. $20 = 8 + 3(12 + 4x)$

6. $-2(w - 7) + 10w = 34$

7. $9y - 4(y + 5) = 40$

8. $10 - 3(m - 2) = 8$

9. $16d - (4 - 5d) = -67$

10. $7(6x - 1) + x = 36$

11. $11 - 2(8 + 3p) = 7^2$

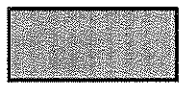
12. $\frac{1}{4}(5b + 11) = 19$

13. $\frac{2}{7}(4m - 18) = 12$

14. $75 = 3(-10t - 3) + 6t$

15. $-\frac{5}{6}(9 + 2x) = 40$

16. Write an equation and solve for x if the area of this rectangle is 133 square units.



17. The Big Screamer Coaster carries 92 people altogether. Some of its cars carry 4 passengers, and the rest carry 6 passengers. There are three less 6-passenger cars than 4-passenger cars. How many 4-passenger cars are there?

What Do You Call Someone Who Can't Turn Pancakes?

Cross out the letter pair next to each correct solution. For each letter pair you DON'T cross out, write the upper case letter in the box containing the lower case letter.

a	b	c	d	e	f	g	h	i	j	k	l	m

1 $9y + 4 = 2y + 25$

2 $5n - 2 = n + 18$

3 $11 + 8q = 3q - 19$

4 $-3 - 10x = 25 + 4x$

5 $15a = 6a - 90$

6 $24 - 5d = d$

7 Xavier is thinking of a number. Nine more than four times the number is the same as fifteen less than twice the number. What is Xavier's number?

8 $2 + 11b = 8b + 15$

9 $7m + 32 = 12 - m$

10 $16 - 5y = 1 - 4y$

11 $2x - 8x + 1 = 9 - 10x$

12 $-3t - 8 + 7t = 34 + 9t - 2$

13 $2a + 3a + 4a = 5a - 18$

14 Yvonne is thinking of a number. Fifty, decreased by three times the number, is the same as seven times the number, increased by 80. What is Yvonne's number?

15 $5(x + 4) = 7x - 26$

16 $20 - 9w = 4(15 - w)$

17 $2(11 + 3n) = 12n$

18 $10 - 4(p + 7) = 2(1 - p)$

19 $11x = 8x - 3(5 - 2x)$

20 $9 - 6(4u - 1) = u + 15$

21 Zabato is thinking of a number. Three times the sum of the number and ten is the same as eight times the number. What is Zabato's number?

e • N	4
a • P	−6
f • I	−1
d • R	−12
l • F	3
b • A	7
i • E	−10
g • S	5
j • L	−9
k • U	−2

c • N	15
k • O	−6
e • H	$-2\frac{1}{2}$
m • T	−3
g • P	$-3\frac{3}{4}$
a • R	−8
l • S	$4\frac{1}{3}$
h • D	2
d • F	11
i • L	$-4\frac{1}{2}$

e • T	−8
l • V	6
h • S	−10
l • P	18
m • E	$3\frac{2}{3}$
e • L	−9
c • N	0
i • G	23
a • P	5
i • F	$6\frac{1}{3}$

Why Do Cowboys Have So Much Trouble With Math?

Solve each equation or problem and find your solution in the answer column. Write the letter of the answer in each box that contains the exercise number. If the answer has a ●, shade in the box instead of writing a letter in it.

(1) $8x + 15 = 3x - 20$

(2) $9n - 2 = 7n + 50$

(3) $18 - 5y = y + 4$

(4) $-7a - 10 = 20 - 3a$

(5) $11d = 81 - 16d$

(6) $-22 - x = 5 + 6x + 9$

(7) $10b - 25 - 3b = 4b - 1$

(8) $33 + 15w = 3w - w + 4w$

(9) The Sun Spa charges annual dues of $125 plus $10 per hour to use the facilities. The Moon Spa charges annual dues of $230 plus $7 per hour to use the facilities. For what number of hours would the two spas charge the same total amount?

Answers 1-9

(A) 8
(I) $-7\frac{1}{2}$
(K) 38
● $-5\frac{1}{7}$
(O) -7
(P) $-3\frac{2}{3}$
(T) 3
(E) $2\frac{1}{3}$
(D) 35
(C) $-4\frac{1}{4}$
(S) 26
(J) 5

(10) $9(m - 2) = m + 40$

(11) $3(2p + 7) = 15(p - 4)$

(12) $5x + 2(11 - 4x) = 82 + x$

(13) $16 - 5(3t - 4) = 8(-2t + 11)$

(14) $7(7c + 1) - 4c = 13(3c - 2)$

(15) $12(5 + 2y) = 4y - (6 - 9y)$

(16) $3q - 16q = 7 + 2(-8q - 3)$

(17) $14 - 3(5t - 12) = 1 - (20t + 1)$

(18) Simon says: "Five times my age 4 years ago is the same as 3 times my age in 2 years." How old is Simon now?

Answers 10-18

(M) 18
(L) $-5\frac{1}{2}$
(N) 13
(G) 9
(R) -10
(B) $-7\frac{3}{4}$
● 52
(W) $7\frac{1}{4}$
(F) 12
(H) $\frac{1}{3}$
(Y) -15
(U) -6

5	16	3	12	6	7	14	10	7	12	2	13	17	1	15	18	9	6	5	16	4	18	11	2	13	15	8

Why Didn't the Astronauts Land on th[illegible]?

Solve each problem, then cross out the letter next to the correct answer.
When you're finished, the answer to the title question will remain.

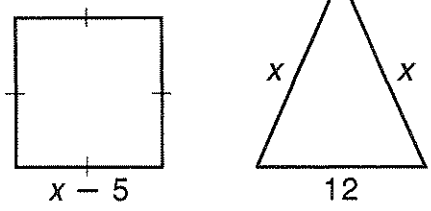
D	1075 ft
L	5°F
O	600
H	$-13\frac{1}{3}$
L	6 h
P	7.5 min
N	144 ft
U	$8400
O	44
F	7 s
O	4 h
S	156 ft
D	$7200
A	$760
M	5 h
H	3°F
W	1250 ft
T	6.4 min
S	9 s
H	16
I	540
T	$640

1 Solve. $4(x - 9) = 7x + 4$

2 The square and the triangle have equal perimeters.

A. Find the value of x.

B. Find the perimeter.



3 Omega just got her pilot's license and wants to rent a plane. The Platinum Plane Company charges $180 plus $92 per hour to rent a plane. The Plastic Plane Company charges $250 plus $78 per hour.

A. For what number of hours would the companies charge the same amount?

B. What would the charge be for that number of hours?

4 The launch site for Trigon Balloon Co. is 250 ft above sea level. A hot-air balloon is launched from the site and begins to rise at a rate of 110 ft/min. At the same time, another balloon 2200 ft above sea level begins to descend at a rate of 150 ft/min.

A. How long will it be until the balloons are at the same elevation?

B. What will their elevation be then?

5 The temperature in Coldspot is –7°F and increasing 2.5° per hour. The temperature in Frostberg is 19°F and decreasing 4° per hour.

A. How long will it be until the temperatures are the same?

B. What will the temperature be then?

6 Trendy T-Shirts has decided to manufacture a new design. It will cost $400 plus $3 per shirt to produce them, and Trendy plans to spend $5000 on advertising. The shirts will sell for $12 each.

A. How many shirts must be sold to break even (total cost equals income from sales)?

B. What is Trendy's income (or total cost) for that many shirts?

7 Romeo and Juliet first saw each other when they were 270 feet apart. Romeo began running toward Juliet at a rate of 16 ft/s. At the same moment, Juliet began running toward Romeo at a rate of 14 ft/s.

A. How many seconds after they started running will they meet?

B. How far will Romeo have run then?

Cow Conundrums

1. How Did Farmer John Find His Missing Cow?

-6	$12\frac{1}{2}$	$\frac{7}{12}$	11	-10	$4\frac{2}{3}$	$-4\frac{1}{2}$	11	$16\frac{1}{3}$	-10	9.2	$\frac{1}{5}$	$16\frac{1}{3}$	$-9\frac{1}{3}$	-30

2. How Did the Cow Get Over the Block of Hay?

54	-6	$12\frac{1}{2}$	$-2\frac{1}{3}$	4	-12	7.4	-14	$12\frac{1}{2}$	$\frac{1}{5}$	14	$\frac{23}{24}$	$4\frac{2}{3}$	5	$12\frac{1}{2}$

Solve each equation and find your solution in the code. Each time the solution appears, write the letter of the exercise above it.

P. $-5 + n + 16 = -3$

O. $4x - x = 7^2$

S. $11 + \frac{a}{6} = 20$

A. $4 = 18 - 3w$

N. $\frac{2}{5}b + 1 = -11$

E. $-9 + 2(x + 6) = 28$

U. $7y - 4(3y - 5) = 80$

C. $10k + 3 = 6k - 15$

B. $-\frac{5}{8} + m = \frac{1}{3}$

W. $7 = -\frac{3}{4}x$

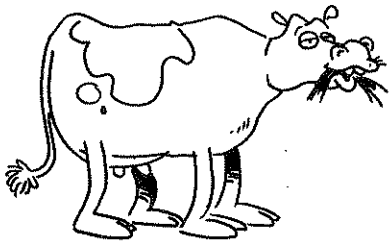
J. $50 = -2 + 13q$

H. $5 - \frac{9}{2}d = 32$

L. $\frac{7a + 1}{2} = 18$

R. $4(2y + 9) = 3y - 14$

M. $2.5n - (-8.2) = 26.7$



D. $-\frac{2}{3}(5p - 16) = 10$

T. $11 - 2(3m - 10) = 5(4 - m)$

What Do Biologists Do When They Visit France?

Solve each formula for the indicated variable. Circle the letter next to your answer. Write this letter in the box at the bottom of the page containing the exercise number.

1 $d = rt$, for r

- **E** $r = \frac{d}{t}$
- **M** $r = \frac{t}{d}$

2 $B = T - Lc$, for T

- **V** $T = \frac{B}{Lc}$
- **O** $T = B + Lc$

3 $S = 2\pi rh$, for h

- **L** $h = \frac{2\pi S}{r}$
- **I** $h = \frac{S}{2\pi r}$

4 $E = mc^2$, for m

- **A** $m = \frac{E}{c^2}$
- **W** $m = \frac{c^2}{E}$

5 $A = \frac{bh}{2}$, for b

- **S** $b = \frac{Ah}{2}$
- **T** $b = \frac{2A}{h}$

6 $y = mx + b$, for b

- **T** $b = \frac{mx}{y}$
- **N** $b = y - mx$

7 $y = mx + b$, for x

- **G** $x = b - my$
- **I** $x = \frac{y - b}{m}$

8 $I = \frac{E}{R}$, for E

- **E** $E = IR$
- **I** $E = \frac{I}{R}$

9 $V = \pi r^2 h$, for h

- **T** $h = \frac{\pi V}{r^2}$
- **G** $h = \frac{V}{\pi r^2}$

10 $T = p + prt$, for r

- **A** $r = \frac{T - p}{pt}$
- **K** $r = \frac{T - pt}{t}$

11 $A = \frac{\pi r^2 S}{360}$, for S

- **E** $S = \frac{360A}{\pi r^2}$
- **F** $S = \frac{360}{\pi r^2 A}$

12 $p = 2l + 2w$, for w

- **N** $w = \frac{p + l}{2}$
- **Y** $w = \frac{p - 2l}{2}$

13 $V = \frac{1}{3}Bh$, for h

- **P** $h = 3VB$
- **S** $h = \frac{3V}{B}$

14 $P = a + (n-1)b$, for b

- **H** $b = \frac{P - a}{n - 1}$
- **R** $b = \frac{(n-1)a}{P}$

15 $h = vt - 16t^2$, for v

- **S** $v = \frac{h + 16t^2}{t}$
- **B** $v = \frac{16t^2 - h}{t}$

16 $m = \frac{2E}{v^2}$, for E

- **L** $E = 2mv^2$
- **G** $E = \frac{mv^2}{2}$

17 $A = \frac{a + b + c}{3}$, for c

- **N** $c = \frac{3A}{a + b}$
- **T** $c = 3A - a - b$

18 $S = \frac{1}{2}at^2$, for t^2

- **P** $t^2 = \frac{2S}{a}$
- **F** $t^2 = \frac{2a}{S}$

19 $F = \frac{9}{5}C + 32$, for C

- **T** $C = \frac{5}{9}F + 32$
- **E** $C = \frac{5}{9}(F - 32)$

20 $V = \frac{4}{3}\pi r^3$, for r^3

- **R** $r^3 = \frac{3V}{4\pi}$
- **D** $r^3 = \frac{4V\pi}{3}$

5	14	8	12	16	2	18	10	20	4	13	7	17	1	15	11	19	3	6	9

Why Aren't Flowers Sold At a Monastery?

From the list at the right, choose a reason to justify each step. Write the letter of your choice in the box at the bottom with the number of that step.

1 $\frac{x}{9} + 16 = 5$

a. $\frac{x}{9} + 16 - 16 = 5 - 16$ _____

b. $\frac{x}{9} = -11$ _____

c. $\frac{x}{9} \cdot 9 = -11 \cdot 9$ _____

d. $x = -99$ _____

Answers for #1

W addition property of equality
O subtraction property of equality
I multiplication property of equality
K division property of equality
T simplifying

2 $5(2a - 3) = 60$

a. $10a - 15 = 60$ _____

b. $10a - 15 + 15 = 60 + 15$ _____

c. $10a = 75$ _____

d. $\frac{10a}{10} = \frac{75}{10}$ _____

e. $a = 7.5$ _____

Answers for #2

S addition property of equality
G subtraction property of equality
M multiplication property of equality
O division property of equality
C commutative property
U associative property
E distributive property
H combining like terms
R simplifying

3 $4n + (7 + n) = 52$

a. $4n + (n + 7) = 52$ _____

b. $(4n + n) + 7 = 52$ _____

c. $5n + 7 = 52$ _____

d. $5n + 7 - 7 = 52 - 7$ _____

e. $5n = 45$ _____

f. $\frac{5n}{5} = \frac{45}{5}$ _____

g. $n = 9$ _____

Answers for #3

R addition property of equality
T subtraction property of equality
D multiplication property of equality
N division property of equality
S commutative property
E associative property
O distributive property
I combining like terms
F simplifying

4 $8t - 3(4t + 2) = 16$

a. $8t - 12t - 6 = 16$ _____

b. $-4t - 6 = 16$ _____

c. $-4t - 6 + 6 = 16 + 6$ _____

d. $-4t = 22$ _____

e. $\frac{-4t}{-4} = \frac{22}{-4}$ _____

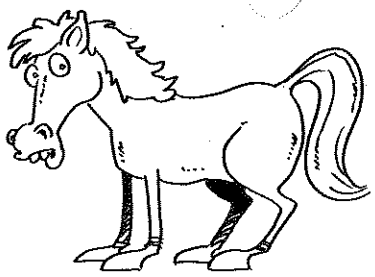
f. $t = -5.5$ _____

Answers for #4

P addition property of equality
S subtraction property of equality
E multiplication property of equality
V division property of equality
T commutative property
B associative property
A distributive property
L combining like terms
R simplifying

3d	2d	4c	2e	3b	4e	2a	3f	1b	3g	4b	1a	4d	3c	2b	1d	3e	4f	1c	4a	2c	3a

What Did the Horse Say When It Fell Down?



Use the information given to complete each table. For table cells that have letters, write the letter in the space under the box containing that answer.

1. The larger of two numbers is 2 less than 3 times the smaller.

smaller number	larger number	sum of the numbers
3		O
8		N
60		I
x		E

EXTRA: Find the numbers if their sum is 42.

2. Jill's score is 5 more than twice Jack's score.

Jack's score	Jill's score	sum of the scores
4		A
15		L
120		N
x		D

EXTRA: Find the scores if their sum is 95.

3. Alpha's age is 1 year less than 4 times Beta's age.

Beta's age	Alpha's age	sum of the ages
3		L
10		D
18		F
x		W

EXTRA: Find the ages if their sum is 74.

238	20	89	$4x-2$	14	50	$4x+3$	49	10	$5x-1$	365	348	17	30	$3x+5$

4. Three numbers are consecutive even integers.

first integer	second integer	third integer	sum of the integers
6			N
-6			P
-90			I
x			C

EXTRA: Find the integers if their sum is 72.

5. Side b of a triangle is twice as long as side a, and side c is 4 cm longer than side b.

Side a (cm)	Side b (cm)	Side c (cm)	Perimeter (cm)
7			D
12			I
45			Y
x			T

EXTRA: Find the side lengths if the perimeter is 94 cm.

6. The length of a rectangle is 3 cm less than twice the width.

Width (cm)	Length (cm)	Perimeter (cm)
9		U
24		G
80		A
x		D

EXTRA: Find the side lengths if the perimeter is 222 cm.

$5x-8$	64	52	$3x+6$	474	24	$5x+4$	456	138	-264	$6x-6$	39	229	48	-12

Where Does a Cow Go After Elementary School?

Solve each problem. Find your solution in the answer column and note the letters next to it. Write these letters in the two boxes above the exercise number at the bottom of the page.

1 The second of two numbers is 6 times the first. Their sum is 84. Find the numbers.

2 The larger of two numbers is 9 more than the smaller. Their sum is 95. Find the numbers.

3 The second of two numbers is 8 more than 3 times the first. Their sum is 72. Find the numbers.

4 The sum of two numbers is 110. The larger number is 2 less than 7 times the smaller. Find the larger number.

5 Jack's bowling score was 20 less than twice Jill's score. The sum of their scores was 205. Find the two scores.

6 Kate cut a 100-foot rope into two pieces. One piece was 5 feet longer than 4 times the length of the other. Find the length of each piece.

7 A pair of skiis and a set of bindings together cost $494. Find the price of each if the skiis cost $10 less than 6 times as much as the bindings.

8 The Bongo family has three children, including a pair of twins. The third child is 3 years younger than the twins. The sum of the three ages is 42. How old is each child?

9 One scoop of ice cream has 5 times as many calories as a sugar cone. Dax bought a sugar cone with two scoops of ice cream. If the two scoops and cone together had 495 calories, how many calories were in each scoop of ice cream?

10 The first of two films lasted 9 minutes less than twice as long as the second. The combined length of the two films plus a 5-minute break between them was 260 minutes. How long was the first film?

answers

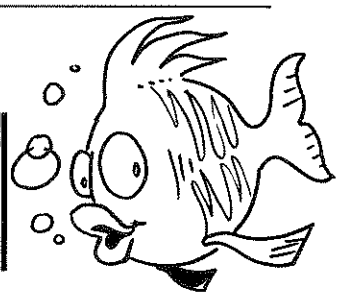
T	R	92
R	Y	$72, $422
O	L	16, 56
A	T	240 cal
A	I	167 min
T	H	17 ft, 83 ft
D	D	12, 72
H	O	15, 15, 12
O	N	96
P	L	80, 125
E	L	$74, $420
T	O	19 ft, 81 ft
I	T	12, 12, 9
E	C	225 cal
A	S	43, 52
O	O	164 min
S	C	75, 130

6	2	9	4	1	10	7	5	8	3

Possibly a "Moodle" School!

TEAM NAME:_____ PARTNER A:_____

How Can You Find Fish in the Encyclopedia?



Solve each problem, then cross out the letters above the solution. When you finish, write the remaining letters in the spaces at the bottom of the page.

1. The second of two numbers is 10 more than 3 times the first. Their sum is 70. Find the numbers.

2. The larger of two numbers is 5 less than 8 times the smaller. Their sum is 94. Find the numbers.

3. The Podunk Village fire truck has two hoses. The length of hose #1 is 20 ft less than 4 times the length of hose #2. The combined length of the two hoses is 380 ft. Find the length of the longer hose.

4. A bottle filled with water weighs 40 lb. If the water by itself weighs 15 times as much as the bottle, what is the weight of the bottle?

5. A triangular sail has two sides the same length. The third side is 9 ft shorter than either of the equal sides. The perimeter of the sail is 63 ft. How long is the shortest side?

6. The sum of three numbers is 79. The second number is 5 times the first, while the third is 16 more than the first. Find the numbers.

7. Together a computer, monitor, and printer cost $1935. The monitor cost $400 less than the computer, and the printer cost $50 more than the monitor. Find the cost of the printer.

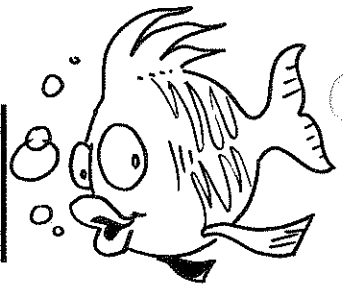
8. The sum of the angle measures of any triangle is 180°. Find the angle measures of a triangle if the second angle measures twice the first, and the third angle measures 15° less than the second.

9. To stay in shape, Julie goes running three times a week. On Wednesday, she ran 4 mi less than on Monday. On Friday, she ran twice as far as she ran on Wednesday. If she ran 26 mi altogether, how far did she run on Friday?

FI	**Y**	**ES**	**SH**	**O**	**ND**	**UC**	**UP**
2.5 lb	13 ft	15, 55	9, 45, 25	$565	39° 78° 63°	12 mi	11, 83
TH	**AN**	**L**	**ET**	**B**	**OO**	**AC**	**K**
$545	285 ft	36° 72° 59°	11 mi	15 ft	11, 55, 24	300 ft	3.2 lb

TEAM NAME:_____ PARTNER B:_____

How Can You Find Fish in the Encyclopedia?



Solve each problem, then cross out the letters above the solution. When you finish, write the remaining letters in the spaces at the bottom of the page.

1. The second of two numbers is 9 more than 4 times the first. Their sum is 89. Find the numbers.

2. The larger of two numbers is 7 less than 6 times the smaller. Their sum is 77. Find the numbers.

3. The Podunk Village fire truck has two hoses. The length of hose #1 is 10 ft less than 3 times the length of hose #2. The combined length of the two hoses is 350 ft. Find the length of the longer hose.

4. A bottle filled with water weighs 42 lb. If the water by itself weighs 11 times as much as the bottle, what is the weight of the bottle?

5. A triangular sail has two sides the same length. The third side is 5 ft shorter than either of the equal sides. The perimeter of the sail is 61 ft. How long is the shortest side?

6. The sum of three numbers is 85. The second number is 8 times the first, while the third is 15 more than the first. Find the numbers.

7. Together a computer, monitor, and printer cost $1775. The monitor cost $300 less than the computer, and the printer cost $50 more than the monitor. Find the cost of the printer.

8. The sum of the angle measures of any triangle is 180°. Find the angle measures of a triangle if the second angle measures twice the first, and the third angle measures 10° less than the second.

9. To stay in shape, Julie goes running three times a week. On Wednesday, she ran 3 mi less than on Monday. On Friday, she ran twice as far as she ran on Wednesday. If she ran 21 mi altogether, how far did she run on Friday?

F	SP	UN	IT	IN	D	O	ER
$525	12, 65	8, 64, 21	9 mi	17 ft	37° 74° 64°	260 ft	$540
W	**ET**	**TH**	**AT**	**RY**	**E**	**UP**	**R**
10 mi	3.5 lb	38° 76° 66°	275 ft	16, 73	3.8 lb	7, 56, 22	16 ft

What Are Dried Grapes Known For That Makes a Teacher Like Them?

Solve each problem and find your answer. Look for the letter of the correct answer in the string of letters near the bottom of the page and cross it out each time it appears. When you finish, write the remaining letters in the space at the bottom of the page.

1 The length of a rectangle is 4 times the width. The perimeter is 90 cm. Find the width and length.

2 The length of a rectangular poster is 7 in. greater than the width. The perimeter is 114 in. Find the width and length.

3 The length of a rectangle is 2 cm more than 5 times the width. The perimeter is 196 cm. Find the width and length.

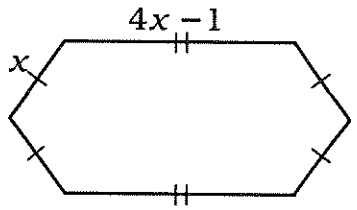
4 The length of a rectangular field is 6 m less than twice the width. The perimeter is 312 m. Find the length of the field.

5 The perimeter of a triangle is 93 ft. Side a of the triangle is twice as long as side b. Side c is 3 ft longer than side a. Find the length of each side.

6 The first side of a triangle is 9 m shorter than the second side. The third side is 3 times as long as the first side. The perimeter is 39 m. Find the length of the longest side.

7 A triangular sail has a perimeter of 57 ft. Side a is 3 ft shorter than twice side b, and side c is 4 ft longer than side b. Find the length of each side.

8 The perimeter of this hexagon is 52 in. Each longer side measures 1 in. less than 4 times the length of a shorter side. Find the length of the side labeled x.



answers

S 27 in., 34 in.
L 18 m
N 24 ft, 16 ft, 20 ft
C 9 cm, 36 cm
T 4.5 in.
H 44 ft, 22 ft, 25 ft
P 16 cm, 82 cm
F 36 ft, 18 ft, 39 ft
A 98 m
I 17 m
G 25 in., 32 in.
E 25 ft, 14 ft, 18 ft
R 3.6 in.
O 102 m
D 15 cm, 77 cm

G T R E A O F I C S T E I P N G H L O A T N E L D C S

answer to puzzle:

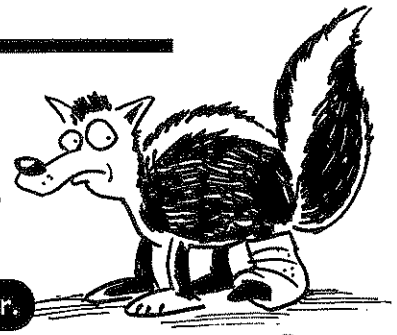
Who Discovered the First Singing and Dancing Hawk?

Solve each problem, then cross out the letter next to the correct answer. When you finish, the answer to the title question will remain.

T	46, 48
H	–57, –55
A	58, 60
T	–13, –11, –9
M	16, 17, 18
A	77, 79
N	–41, –40, –39
O	44, 46, 48
L	54, 56
T	72, 74, 76
D	42, 44
O	–28, –27, –26
N	29, 31, 33, 35
E	–11, –9, –7
S	17, 18, 19
C	37, 38
H	81, 83
O	68, 70, 72
F	48, 50, 52
U	–39, –38, –37
P	33, 35, 37, 39
T	–27, –26, –25
N	–59, –57

1. Find two consecutive integers whose sum is 75.
2. Find three consecutive integers whose sum is 51.
3. Find three consecutive integers whose sum is –78.
4. Find two consecutive even integers whose sum is 94.
5. Find three consecutive even integers whose sum is 222.
6. Find two consecutive odd integers whose sum is –116.
7. Find four consecutive odd integers whose sum is 128.
8. Find two consecutive even integers such that the sum of the larger and 3 times the smaller is 234.
9. Find two consecutive odd integers such that the sum of the smaller and 3 times the larger is 330.
10. Find three consecutive integers such that the sum of the largest and 5 times the smallest is –244.
11. Find three consecutive even integers such that the sum of twice the smallest and 4 times the largest is 304.
12. Find three consecutive odd integers such that the sum of 7 times the smallest and twice the largest is –91.

What's a Good Way to Describe a Broken Skunk?



Write the letter of each problem in the box above its answer.

O A disk costs $3 more than a tape. Rolex bought five disks and two tapes. The total cost was $120. What was the price of a disk?

T Mickey's bowling score is 16 less than 3 times Minnie's score. The sum of their scores is 228. Find the score of each.

O An apple has 24 fewer calories than a banana. If 7 bananas have the same number of calories as 10 apples, how many calories are in a banana?

R A triangular pennant has two sides the same length. The third side is 9 in. shorter than either of the equal sides. The perimeter of the pennant is 57 in. How long is the shortest side?

O The larger of two consecutive integers is 10 more than 4 times the smaller. Find the integers.

F Mike said, "Last week I ran 15 miles farther than Bill." Pete said, "Last week I ran one mile less than 3 times as far as Bill." If Mike and Pete ran the same distance, how far did Bill run?

O An algebra book weighs 6 oz less than twice as much as a grammar book. If 5 algebra books weigh the same as 8 grammar books, how much does an algebra book weigh?

U The length of a rectangle is 3 times the width. If the length is increased by 4 cm and the width is decreased by 1 cm, the perimeter will be 102 cm. Find the dimensions of the original rectangle.

D Cycle Paths, Inc. make bicycles, tricycles, and unicycles. Last week they made 120 more bicycles than unicycles, and 4 times as many tricycles as unicycles. If they made 75 more bicycles than tricycles, how many unicycles did they make?

9 mi	−3, −2	12 cm, 36 cm	61, 167	83 cal	15 in.	28 oz	80 cal	8 mi	10 cm, 30 cm	63, 165	−7, −6	$18	15	24 oz	13 in.	16

What Happened When General Custer Took Off His Boots?

Solve each problem and find your solution in the answer column. Write the letter of the answer in each box containing the exercise number.

1 Two trains left Mooseport at the same time. One traveled north at 83 mph. The other traveled south at 67 mph. After how many hours were the two trains 600 miles apart?

2 A train left Mooseport traveling west at 50 mph. One hour later, another train left Mooseport traveling east at 70 mph. How many hours had the first train been traveling when they were 350 miles apart?

3 Two planes are traveling toward each other and are 950 miles apart. One plane is flying at 170 mph. The other is flying at 210 mph. In how many hours will the planes pass each other?

4 Romeo first saw Juliet when she was 87 meters away. He started running toward her at a rate of 5 m/s. Three seconds later, Juliet saw Romeo and began running toward him at a rate of 4 m/s. How many seconds after Romeo first saw Juliet did they meet?

5 In Exercise #4, how far had Romeo run when he met Juliet?

6 A stagecoach left Dry Gulch traveling east at 30 km/h. Two hours later, another stagecoach left Dry Gulch traveling in the same direction at 40 km/h. How many hours had the first stagecoach been traveling when the second stagecoach caught up?

7 Bad Bart is fleeing the scene of a bank robbery at 70 mph. Thirty minutes after he leaves, a police helicopter leaves the scene to catch him, traveling 100 mph along the same route. How many hours will Bart have been traveling when the police catch up?

8 Belle Strong is swimming in Lochness Lake, 230 feet from shore. Suddenly she screams for help and starts swimming toward shore at 2 ft/s. Ten seconds later, Maxx Magnum starts toward her in a rowboat, traveling 5 ft/s. How many seconds will Belle have been swimming when Maxx reaches her?

9 In Exercise #8, how far will Maxx have rowed when he reaches Belle?

B	$1\frac{1}{4}$ h
T	11 s
E	40 s
N	$5\frac{1}{3}$ h
L	55 m
S	4 h
M	150 ft
D	$2\frac{1}{2}$ h
O	38 s
F	$1\frac{2}{3}$ h
I	64 m
A	$3\frac{1}{2}$ h
R	132 ft
H	8 h
P	15 s

6	8	1	9	8	5	5	8	3	3	8	7	8	2	4