Lesson 1

Solve each equation.

1. $72 - b = 30$ $\qquad b = \underline{}$
2. $16c = 64$ $\qquad c = \underline{} \cdot$
3. $e^2 + 50 = 450$ $\qquad e = \underline{}$
4. $4^2 + (h \div 5) = 21$ $\qquad h = \underline{}$
5. $5(i + 1) = 100$ $\qquad i = \underline{}$
6. $0.8k = 80$ $\qquad k = \underline{}$
7. $40(o + 0.5) = 80$ $\qquad o = \underline{}$
8. $s^2 - 4^2 = 3^2$ $\qquad s = \underline{}$
9. $\dfrac{20}{40} = \dfrac{t}{2}$ $\qquad t = \underline{}$
10. $(u + 5) \div 8 = 2$ $\qquad u = \underline{}$

Use your answers to Exercises 1–10 to answer the question below. Write the variable above its value in the blanks below.

Question: Ted is not sure if 23 is the correct value for x in the equation $x - 8 = 15$. What should he do to be sure that x does equal 23?

Answer: $\underline{}$ $\underline{}$ $\underline{}$ $\underline{}$ $\underline{}$ $\underline{}$ $\underline{}$ $\underline{}$ $\underline{}$ $\underline{}$

     5   11   42   5   1   19   1   11   1   20

    $\underline{}$ $\underline{}$ $\qquad$ $\underline{}$ $\underline{}$ $\underline{}$ $\underline{}$ $\underline{}$

    1   1.5   4   25   20   4   100

Write expressions similar to those in Exercises 1–10.

11. $\underline{}$ $\qquad a = \underline{}$
12. $\underline{}$ $\qquad r = \underline{}$
13. $\underline{}$ $\qquad e = \underline{}$
14. $\underline{}$ $\qquad a = \underline{}$

Write a question that has "area" as the answer.

Question: $\underline{}$

$\underline{}$

Answer: Area

Lesson 2

Write your answer in the blank next to each statement.

1. The denominator of $\frac{13}{107}$ in simplest form

2. The denominator of $\frac{4}{90}$ in simplest form

3. The least common multiple of 2, 3, and 19

4. The greatest one-digit prime number

5. The least three-digit square number (*Hint:* Other square numbers are 4, 9, 16, and 25 .... Also, note that $2^2 = 4$, $3^2 = 9, 4^2 = 16$ ....)

6. The greatest common factor of 120 and 160

7. The value of $2^2 \times 5$

8. The numerator of $\frac{6}{9}$ in simplest form

9. The greatest common factor of 42 and 54

10. The missing number in this prime factorization: $45 = 3^2 \times$ _____

11. The value of $2^3 \times 3^2$

12. What two-digit number has two one-digit factors that have a sum of 16 and a difference of 2?

13. The greatest common factor of 12 and 15

14. The greatest two-digit multiple of 10

15. Nine is the GCF of 18 and this two-digit number between 50 and 60.

16. The value of 3^4

17. The missing denominator in $\frac{7}{32} = \frac{28}{?}$

18. The only composite number between 0 and 6

19. The value of $3^3 \times 5$

20. The greatest common factor of 142 and 284

21. The greatest common factor of 25 and 36

22. The missing denominator in $\frac{4}{20} = \frac{6}{?}$

23. The square of the least two-digit prime number

24. The least two-digit composite number

25. The denominator of $\frac{10}{16}$ in simplest form

A _____
C _____
C _____
F _____

F _____
H _____
I _____
I _____
I _____

L _____
M _____

M _____
M _____
N _____

O _____
O _____
O _____

P _____
R _____
S _____
S _____
T _____

T _____
W _____
Y _____

Use your answers from Exercises 1–25 and arrange them in order from least to greatest. Then write the corresponding letters to get a message about simplifying fractions.

Check: ___ ___ ___ ___ ___ ___ ___ ___   ___ ___ ___ ___

___ ___ ___ ___ ___ ___   ___ ___ ___ ___ ___ ___ ___

Lesson 3

Write your answer as a whole number, mixed number, or fraction.

1. $\frac{13}{8}$ written as a mixed number _____

2. The product of any nonzero number and its reciprocal _____

3. $\frac{1}{2} \times \frac{1}{2}$ _____

4. $\frac{3}{8} \times 1\frac{1}{2}$ _____

5. The reciprocal of 2 _____

6. $\frac{3}{8} \div \frac{1}{2}$ _____

7. $1\frac{1}{10} \div \frac{4}{5}$ _____

8. The product of zero and any number _____

9. $\frac{1}{2} \times 1\frac{7}{8}$ _____

10. $2\frac{3}{8} \div 2$ _____

11. Half of $3\frac{3}{8}$ _____

12. $1 \div 8$ _____

13. Double $\frac{17}{32}$ _____

14. $2\frac{1}{2} \div 1\frac{1}{3}$ _____

15. $\frac{3}{16} \times 2$ _____

16. The number of sixteenths in $\frac{1}{8}$ _____

17. Arrange your answers from Exercises 1–16 in order from least to greatest above the number line.
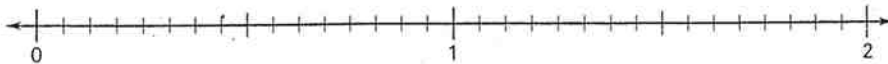
18. Create your own version of this activity using at least six exercises and a number line labeled from 0 to 3.

Lesson 4

Write the sum or difference for each expression in the grid.

26 − 19	17 + (−22)	−21 + 26	−17 + 10
−26 + 33	13 − 22	−4 − (−12)	−8 − (−2)
42 − 46	−8 − (−17)	−25 + 17	146 − 143
−20 − (−10)	−18 + 23	−23 + 18	25 + (−15)

1. Order your magic square answers by plotting them on the number line below. Label each point.

$$\overset{\hspace{3.2cm}0}{\longleftarrow \!\!+\!\!\longrightarrow}$$
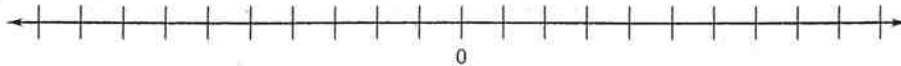
2. For a magic square to be magic, the sum of each row, column, and diagonal must be the same. Find the sum for each row, column, and diagonal.

3. Make your own magic square using positive and negative numbers. *Hint:* Use a pencil with a good eraser and start with simple numbers.

Lesson 5

Write the expression or equation that matches each phrase or sentence.

Phrase or Sentence	Expression or Equation
1. 25 plus a number	$i + 25 = 76$
2. 92 is half of a number.	$3.5n + 6$
3. The product of 25 and a number	$92i = \frac{1}{2}$
4. 4 less than half of a number is 92.	$4e - 92 = \frac{1}{2}$
5. The quotient of a number divided by 6	$25 + c$
6. 25 more than a number is 76.	$\frac{1}{2}f - 4 = 92$
7. The quotient of 6 divided by a number	$\dfrac{f}{6}$
8. The product of 92 and a number is $\frac{1}{2}$.	$92 = \dfrac{o}{2}$
9. 92 less than 4 times a number is $\frac{1}{2}$.	$3.5t = 6$
10. The sum of $3\frac{1}{2}$ times a number plus 6	$\dfrac{6}{c}$
11. $3\frac{1}{2}$ times a number is 6.	$25e$

12. Use your answers from Exercises 1–11. Write the variables from the matching expression or equation in order from 1 to 11. Use the word that is spelled out to complete the statement below.

In the equation $25y + 6 = 42$, the number 25 is the _____ of $25y$.

Write your own matching exercises similar to Exercises 1–11. Write the exercises so that the variables within the expressions or equations when ordered from 13 to 18 spell out the word *number*.

Phrase or Sentence	Expression or Equation
13. _____	_____
14. _____	_____
15. _____	_____
16. _____	_____
17. _____	_____
18. _____	_____

Lesson 6

Find each sum or difference.

1. $-67 + 18$

2. $43 - 19$

3. $|-18| + |9|$

4. $-16 - (-12)$

5. $|20| - |-5|$

1. _____

2. _____

3. _____

4. _____

5. _____

Find each product or quotient.

6. $-38(-3)$

7. $-72 \div (-12)$

8. $-9 \cdot 23$

9. $-150 \div 5$

10. $564 \div |-4|$

6. _____

7. _____

8. _____

9. _____

10. _____

Replace each ❀ with $<$, $>$, or $=$ to make a true sentence.

11. -4 ❀ 1

12. 7 ❀ -6

13. $6(-3)$ ❀ $2(-9)$

14. $x - (-5)$ ❀ 12 if $x = 7$

11. _____

12. _____

13. _____

14. _____

Order the integers in each set from least to greatest.

15. $\{1, -2, 7, 4, -5\}$

16. $\{5, -3, 0, 3, -1\}$

15. _____

16. _____

Evaluate each expression if $r = 2$, $s = -3$, and $t = 5$.

17. $2r + 3t$

18. $4s - 3r$

19. $rst - st$

17. _____

18. _____

19. _____

Lesson 7

Draw the line that has the given slope and passes through the given point.

	Slope	Contains Points
1.	0	(4, 8)
2.	0	(4, 1)
3.	−1	(2, 3)
4.	−1	(7, 8)
5.	1	(2, 6)
6.	1	(7, 1)
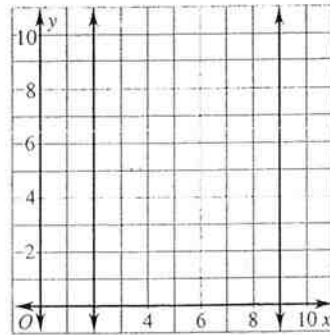
7. What geometric figure is created by the intersections of the lines? Use only the intersections in which x and y are both less than 9 and greater than 0.5. _____

Draw a rectangle that is created by the intersection of non-vertical lines. Make the rectangle twice as long as it is wide.
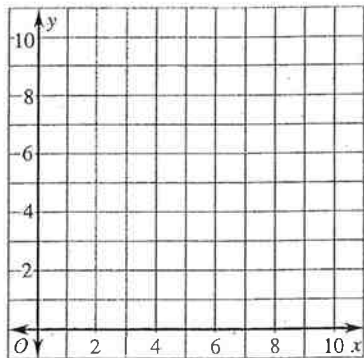
Fill in the table below with information about the slope of each line and a point on each line that forms your rectangle. Without showing your rectangle, give the information in your table to a classmate to try drawing your rectangle on graph paper.

Slope of Line	Contains Points

Lesson 8

Solve each equation. Check your solution.

1. $2(g - 7) = 16$

2. $5(x + 2) = 30$

3. $3(2d + 7) = 39$

4. $4(a - 2) = 3(a + 4)$

5. $3(f + 2) + 9 = 13 + 5f$

6. $2(x - 4) = 3(1 + x)$

7. $2n + 5 = 4(n + 2) - n$

8. $4(x + 3) = x$

9. $2(c - 3) = 76$

10. $7(x - 2) = 5(x + 2)$

11. $2(6x + 1) = 4(x - 5) - 2$

12. $4(2b - 6) + 11 = 8b - 13$

13. $6 + 6(2t - 1) = 3 + 12t$

14. $9t - 21 = 3(t - 7) + 6t$

15. $3(4k + 14) = 10k - 2(k - 7)$

Find the dimensions of each rectangle. The perimeter is given.

16. $P = 380$ m

w

$w + 20$

17. $P = 640$ yd

w

$3w - 12$

18. $P = 220$ ft

$2w - 40$

w

19. $P = 380$ yd

$5w + 10$

w

20. $P = 300$ m

w

$w + 90$
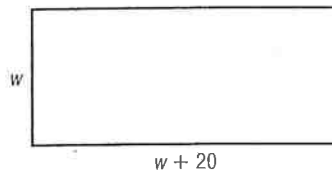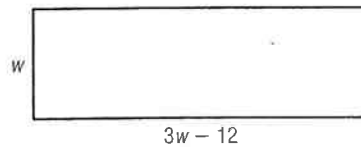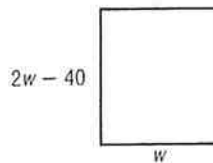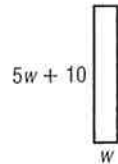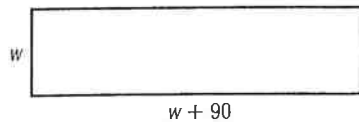
Lesson 9

Solve each inequality and check your solution. Graph the solution on a number line.

1. $3x + 9 < 18$
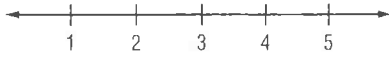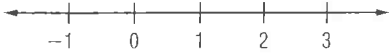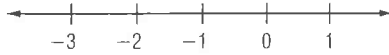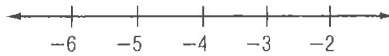
(number line: 1 2 3 4 5)

2. $5 + 2c < -9$

(number line: −9 −8 −7 −6 −5)

3. $4x - 3 < 2 - x$

(number line: −1 0 1 2 3)

4. $3(n + 2) < 24$

(number line: 4 5 6 7 8)

5. $11 + 2b \le 3(2 - b)$

(number line: −3 −2 −1 0 1)

6. $\dfrac{m}{3} + 5 \ge 2$

(number line: −11 −10 −9 −8 −7)

7. $\dfrac{1}{2}(8 - x) > 6$

(number line: −6 −5 −4 −3 −2)

8. $\dfrac{c}{4} + 7 \ge 5$

(number line: −10 −9 −8 −7 −6)

9. $y - 3 < 5y + 1$

(number line: −3 −2 −1 0 1)

10. $20 - 2n > 26$

(number line: −5 −4 −3 −2 −1)

11. $\dfrac{1}{3}(x - 6) < 2$

(number line: 10 11 12 13 14)

12. $5 - 2k \le 15$

(number line: −7 −6 −5 −4 −3)

13. $-2(3 + t) < -8$

(number line: −1 0 1 2 3)

14. $\dfrac{n}{4} - 9 > 5$

(number line: 54 55 56 57 58)
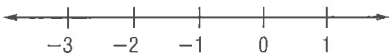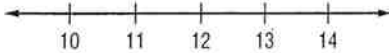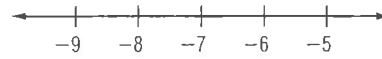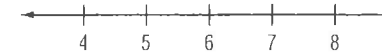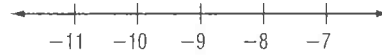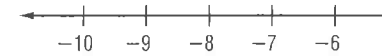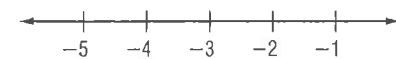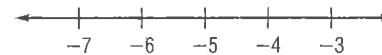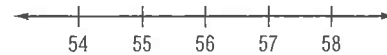
15. Two times a number less 4 is greater than the same number plus 6. For what number or numbers is this true?

16. One-half of the sum of a number and 4 is less than 14. What is the number?

17. **FISHING** Benjamin wants to go fishing on the lake. A boat rents for $12 per hour and a rod and reel rent for $20 per day. If he wants to spend no more than $80, how many hours can he spend fishing in the boat?

18. **ENTERTAINING** Deena is inviting 10 friends to a party. If she wants to spend no more than $120 on her guests, and dinner for each guest costs $8, what is the most can she spend on party favors for each person?

Lesson 10

Pythagorean Theorem

- **Words** If a triangle is a right triangle, then the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs.

- **Model**
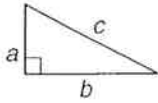
- **Symbols** $c^2 = a^2 + b^2$

Example Find the length of the hypotenuse of the right triangle.

$c^2 = a^2 + b^2$ Pythagorean Theorem

$c^2 = 16^2 + 30^2$ Replace a with 16 and b with 30.

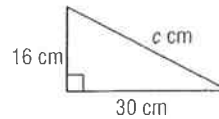$c^2 = 256 + 900$ Evaluate 16^2 and 30^2.

$c^2 = 1156$ Add 256 and 900.

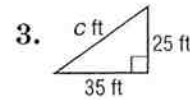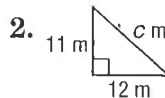$\sqrt{c^2} = \pm\sqrt{1156}$ Take the square root of each side. Only use the positive root
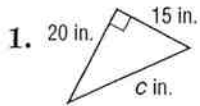
$c = 34$ Simplify.

The length of the hypotenuse is 34 cm.

Exercises

Find the length of the hypotenuse in each right triangle. Round to the nearest tenth if necessary.

1.   20 in.   15 in.   c in.

2.   11 m   c m   12 m

3.   c ft   25 ft   35 ft

If c is the measure of the hypotenuse, find each missing measure. Round to the nearest tenth, if necessary.

4. $a = 18, b = 80, c = ?$

5. $a = ?, b = 70, c = 74$

6. $a = 14, b = ?, c = 22$

7. $a = ?, b = 48, c = 57$

The lengths of three sides of a triangle are given. Determine whether each triangle is a right triangle.

8. $a = 16, b = 30, c = 34$

9. $a = 25, b = 31, c = 37$

10. $a = 21, b = 29, c = 42$