

6th Grade Math

Monday, April 27 – Lesson 11-4, Writing Inequalities

Tuesday, April 28 – Lesson 12-1, Graphing on the Coordinate Plane

Wednesday, April 29 – Lesson 12-3, Writing Equations from Tables


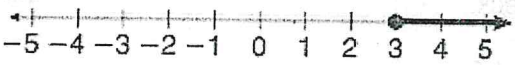
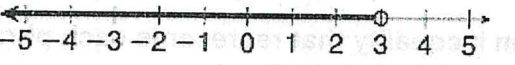
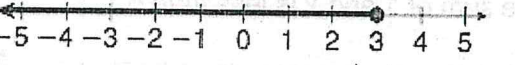
Thursday, April 30 – Lesson 13-2, Area of Triangles

Friday, May 1 – Lesson 13-1, Area of Quadrilaterals

LESSON
11-4 **Writing Inequalities**
Reteach

An equation is a statement that says two quantities are equal. An **inequality** is a statement that says two quantities are **not** equal.

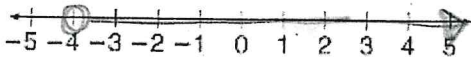
A **solution of an inequality** that contains a variable is any value or values of the variable that makes the inequality true. All values that make the inequality true can be shown on a graph.

Inequality	Meaning	Solution of Inequality
$x > 3$	All numbers <i>greater than</i> 3	 The <i>open circle</i> at 3 shows that the value 3 is not included in the solution.
$x \geq 3$	All numbers <i>greater than or equal to</i> 3	 The <i>closed circle</i> at 3 shows that the value 3 is included in the solution.
$x < 3$	All numbers <i>less than</i> 3	 The <i>open circle</i> at 3 shows that the value 3 is not included in the solution.
$x \leq 3$	All numbers <i>less than or equal to</i> 3	 The <i>closed circle</i> at 3 shows that the value 3 is included in the solution.

Graph the solutions of each inequality.

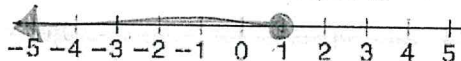
1. $x > -4$

- Draw an open circle at -4 .
- Read $x > -4$ as "x is greater than -4 ."
- Draw an arrow to the right of -4 .



2. $x \leq 1$

- Draw a closed circle at 1.
- Read $x \leq 1$ as "x is less than or equal to 1."
- Draw an arrow to the left of 1.



3. $a > -1$



4. $y \leq 3$



Write an inequality that represents each phrase.

5. The sum of 2 and 3 is less than y.

$$\underline{2 + 3 < y}$$

$$5 < y$$

6. The sum of y and 2 is greater than or equal to 6.

$$\underline{y + 2 \geq 6}$$

$$\begin{array}{r} -2 \quad -2 \\ y \geq 4 \end{array}$$

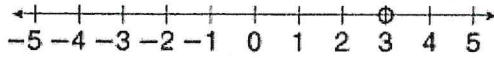
LESSON
11-4

Writing Inequalities

Practice and Problem Solving: A/B

Complete the graph for each inequality.

1. $a > 3$



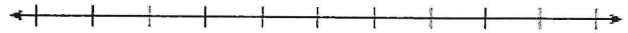
2. $r \leq -2$



Graph the solutions of each inequality. Check the solutions.

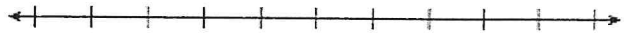
3. $w \geq 0$

Check: _____



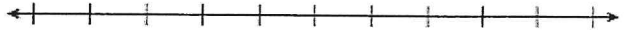
4. $b \leq -4$

Check: _____



5. $a < 1.5$

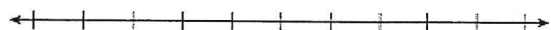
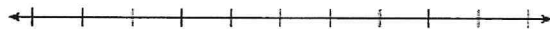
Check: _____



Write an inequality that represents each phrase. Draw a graph to represent the inequality.

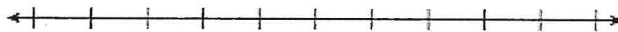
6. The sum of 1 and x is less than 5.

7. 3 is less than y minus 2.

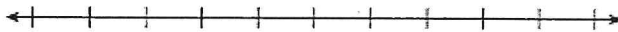


Write and graph an inequality to represent each situation.

8. The temperature today will be at least 10°F . _____

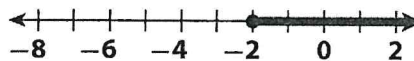


9. Ben wants to spend no more than \$3. _____

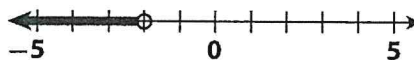


Write an inequality that matches the number line model.

10. _____



11. _____



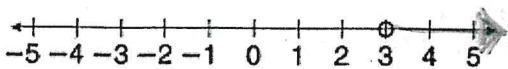
LESSON
11-4

Writing Inequalities

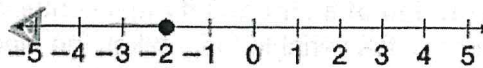
Practice and Problem Solving: A/B

Complete the graph for each inequality.

1. $a > 3$



2. $r \leq -2$



Graph the solutions of each inequality. Check the solutions.

There are other solutions.

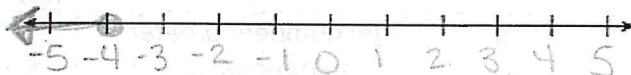
3. $w \geq 0$

if
Check: $w=1$ $1 \geq 0$



4. $b \leq -4$

if
Check: $b=-5$ $-5 \leq -4$



5. $a < 1.5$

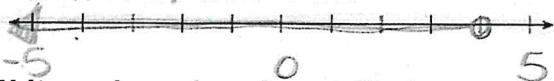
if
Check: $a=1$ $1 < 1.5$



Write an inequality that represents each phrase. Draw a graph to represent the inequality.

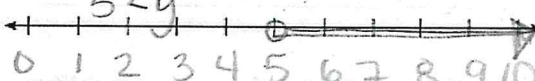
6. The sum of 1 and x is less than 5.

$1+x < 5$
 $x < 4$



7. 3 is less than y minus 2.

$3 < y-2$
 $+2$ $+2$
 $5 < y$



Write and graph an inequality to represent each situation.

8. The temperature today will be at least 10°F.

$10 \leq t$ or $t \geq 10$



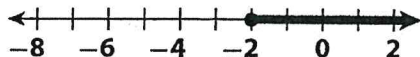
9. Ben wants to spend no more than \$3.

$m \leq 3$ or $3 \geq m$

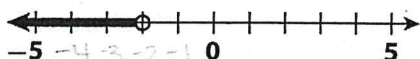


Write an inequality that matches the number line model.

10. $-2 \leq x$ or $x \geq 2$



11. $x < -2$ or $-2 > x$

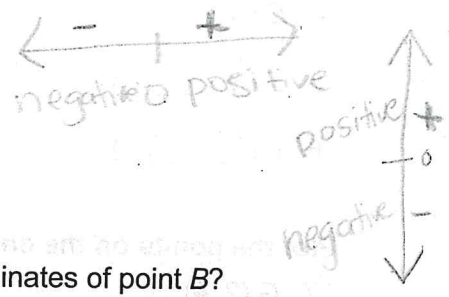


LESSON 12-1 **Graphing on the Coordinate Plane**
Reteach

Each quadrant of the coordinate plane has a unique combination of positive and negative signs for the x-coordinates and y-coordinates as shown here.

Quadrant	x-coordinate	y-coordinate
1 I	+	+
2 II	-	+
3 III	-	-
4 IV	+	-

OU Over then up
 (x,y)



Use these rules when naming points on the coordinate plane.

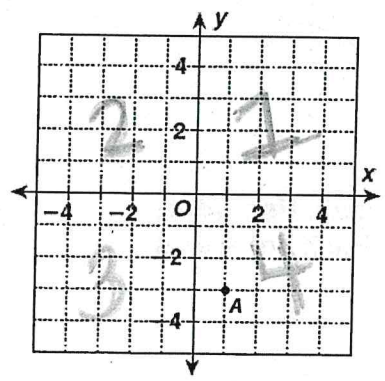
Example 1

Draw the point A(1, -3) on the coordinate grid.

Solution

According to the table, this point will be in Quadrant IV.

So, go to the *right* (+) one unit, and go *down* (-) three units.



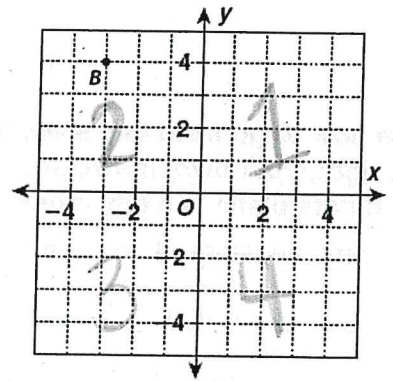
Example 2

What are the coordinates of point B?

Solution

According to the table, this point will have a negative x-coordinate and a positive y-coordinate.

Point B is 3 three units to the *left* (-) and four units *up* (+). So the coordinates of point B are (-3, 4).



Add the correct sign for each point's coordinates.

This part can be confusing. Just remember Over Up!

- 1. (- 3, + 4) in _____ Quadrant II
- 2. (+ 2, - 5) in _____ Quadrant IV
- 3. (+ 9, + 1) in _____ Quadrant I

4. In which quadrant is the point (0, 7) located? Explain your answer.

This point does not fall in a quadrant. It is on the y-axis.

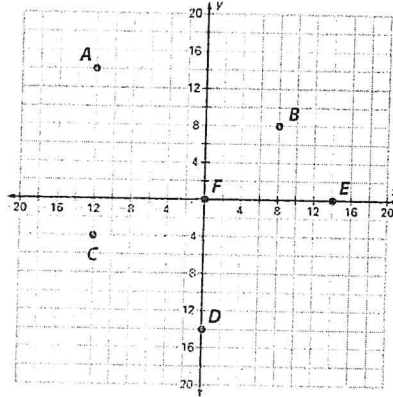
LESSON
12-1

Graphing on the Coordinate Plane

Practice and Problem Solving: A/B

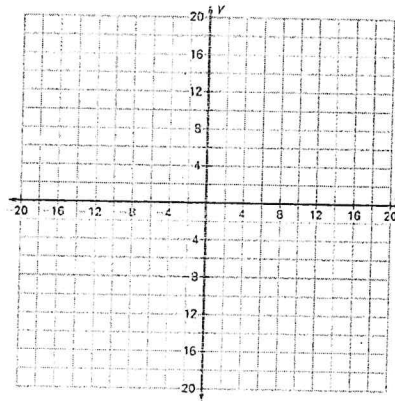
Give the coordinates of the points on the coordinate plane.

1. A (____, ____)
2. B (____, ____)
3. C (____, ____)
4. D (____, ____)
5. E (____, ____)
6. F (____, ____)



Plot the points on the coordinate plane.

7. G (2, 4)
8. H (-6, 8)
9. J (10, -12)
10. K (-14, -16)
11. M (0, 18)
12. P (-20, 0)

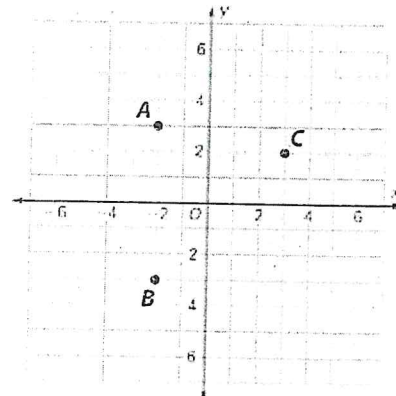


Describe how to go from one store to the next on the map. Use words like *left*, *right*, *up*, *down*, *north*, *south*, *east*, and *west*. Each square on the coordinate plane is a city block.

13. The computer store, A, to the food store, B.

14. The computer store, A, to the hardware store, C.

15. The hardware store, C, to the food store, B.



LESSON
12-1 **Graphing on the Coordinate Plane**
Reteach

Each quadrant of the coordinate plane has a unique combination of positive and negative signs for the x-coordinates and y-coordinates as shown here.

Quadrant	x-coordinate	y-coordinate
1 I	+	+
2 II	-	+
3 III	-	-
4 IV	+	-

OU Over then up down
(x,y)
← - + → negative positive
↑ positive ↓ negative

Use these rules when naming points on the coordinate plane.

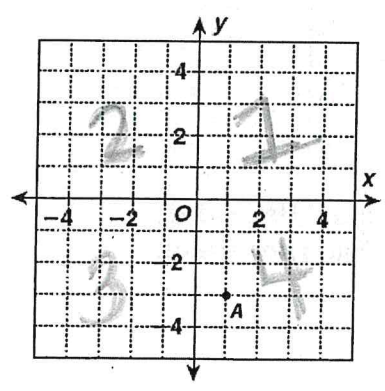
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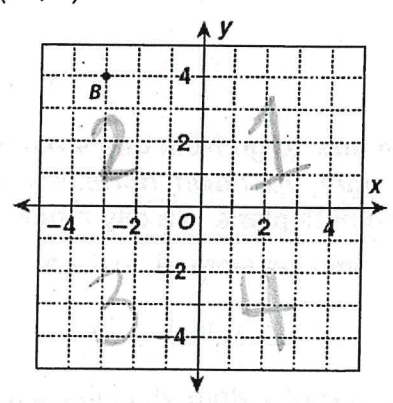
Example 2

What are the coordinates of point B?

Solution

According to the table, this point will have a negative x-coordinate and a positive y-coordinate.

Point B is 3 three units to the *left* (-) and four units *up* (+). So the coordinates of point B are (-3, 4).



Add the correct sign for each point's coordinates.

This part can be confusing. Just remember Over Up!

1. (- 3, + 4) in Quadrant II 2. (+ 2, - 5) in Quadrant IV 3. (+ 9, + 1) in Quadrant I

4. In which quadrant is the point (0, 7) located? Explain your answer.

This point does not fall in a quadrant. It is on the y-axis.

LESSON
12-3

Writing Equations from Tables

Reteach

The relationship between two variables in which one quantity depends on the other can be modeled by an equation. The equation expresses the dependent variable y in terms of the independent variable x .

What do you do to x to get to y ?

x	0	1	2	3	4	5	6	7
y	4	5	6	7	8	9	10	?

To write an equation from a table of values, first compare the x - and y -values to find a pattern.

In each, the y -value is 4 more than the x -value.

Then use the pattern to write an equation expressing y in terms of x .

$y = x + 4$

You can use the equation to find the missing value in the table. To find y when $x = 7$, substitute 7 in for x in the equation.

$y = x + 4$
 $y = 7 + 4$
 $y = 11$
 So, y is 11 when x is 7.

Write an equation to express y in terms of x . Use your equation to find the missing value of y :

1.

x	1	2	3	4	5	6
y	3	6	9	12	15	?

*$1 \times 3 = 3$ $3 \times 3 = 9$
 $2 \times 3 = 6$ $6 \times 3 = 18$
 $x \cdot 3 = y$ or $3x = y$; 18*

2.

x	18	17	16	15	14	13
y	15	14	13	?	11	10

*$18 - 3 = 15$
 $17 - 3 = 14$
 $15 - 3 = 12$
 $x - 3 = y$; 12*

To solve a real-world problem, use a table of values and an equation.

When Todd is 8, Jane is 1. When Todd is 10, Jane will be 3. When Todd is 16, Jane will be 9. What is Jane's age when Todd is 45?

Todd, x	8	10	16	45
Jane, y	1	3	9	?

Jane is 7 years younger than Todd.

So $y = x - 7$. When $x = 45$, $y = 45 - 7$. So, $y = 38$.

Solve.

3. When a rectangle is 3 inches wide its length is 6 inches. When it is 4 inches wide its length will be 8 inches. When it is 9 inches wide its length will be 18 inches. Write and solve an equation to complete the table.

Width, x	3	4	9	20
Length, y	6	8	18	

$x \cdot 2 = y$ or $2x = y$

When the rectangle is 20 inches wide, its length is 40 inches.

*x y
 $3 \cdot 2 = 6$
 $4 \cdot 2 = 8$
 $9 \cdot 2 = 18$
 $20 \cdot 2 = 40$*

LESSON
12-3

Writing Equations from Tables

Practice and Problem Solving: A/B

Write an equation to express y in terms of x . Use your equation to complete the table.

1.

x	1	2	3	4	5
y	7	14	21	28	

2.

x	2	3	4	5	6
y	-3	-2	-1	0	

3.

x	20	16	12	8	4
y	10	8	6	4	

4.

x	7	8	9	10	11
y	11	12	13	14	

Solve.

5. Henry records how many days he rides his bike and how far he rides each week. He rides the same distance each time. He rode 18 miles in 3 days, 24 miles in 4 days, and 42 miles in 7 days. Write and solve an equation to find how far he rides his bike in 10 days.

Number of days, d	3	4	7	10
Number of miles, m	18			

Equation relating d and m is _____.

The number of miles Henry rides his bike in 10 days is _____.

6. When Cabrini is 6, Nikos is 2. When Cabrini is 10, Nikos will be 6. When Cabrini is 16, Nikos will be 12. When Cabrini is 21, Nikos will be 17. Write and solve an equation to find Nikos' age when Cabrini is 40.

Cabrini's age, x	6	10	16	21	40
Nikos' age, y	2				

Equation relating x and y is _____.

When Cabrini is 40 years old, Nikos will be _____.

LESSON
12-3

Writing Equations from Tables

Practice and Problem Solving: A/B

Write an equation to express y in terms of x . Use your equation to complete the table.

1.

x	1	2	3	4	5
y	7	14	21	28	35

$5 \cdot 7 = 35$

$x \cdot 7 = y$ or $7x = y$

2.

x	2	3	4	5	6
y	-3	-2	-1	0	1

$6 - 5 = 1$

$x - 5 = y$

3.

x	20	16	12	8	4
y	10	8	6	4	2

$4 \div 2 = 2$

$x \div 2 = y$ or $\frac{x}{2} = y$

4.

x	7	8	9	10	11
y	11	12	13	14	15

$\frac{1}{2}x = y$

$x + 4 = y$ $11 + 4 = 15$

Solve.

5. Henry records how many days he rides his bike and how far he rides each week. He rides the same distance each time. He rode 18 miles in 3 days, 24 miles in 4 days, and 42 miles in 7 days. Write and solve an equation to find how far he rides his bike in 10 days.

Number of days, d	3	4	7	10
Number of miles, m	18	24	42	60

$3 \cdot 6 = 18$
 $4 \cdot 6 = 24$

$7 \cdot 6 = 42$
 $10 \cdot 6 = 60$

Equation relating d and m is $d \cdot 6 = m$ or $6d = m$

The number of miles Henry rides his bike in 10 days is 60 miles

6. When Cabrini is 6, Nikos is 2. When Cabrini is 10, Nikos will be 6. When Cabrini is 16, Nikos will be 12. When Cabrini is 21, Nikos will be 17. Write and solve an equation to find Nikos' age when Cabrini is 40.

Cabrini's age, x	6	10	16	21	40
Nikos' age, y	2	6	12	17	36

$6 - 4 = 2$
 $10 - 4 = 6$

$16 - 4 = 12$
 $21 - 4 = 17$
 $40 - 4 = 36$

Equation relating x and y is $x - 4 = y$

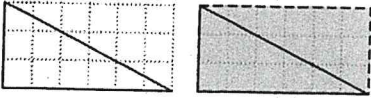
When Cabrini is 40 years old, Nikos will be 36 years old.

LESSON
13-2

Area of Triangles

Reteach

To find the area of a triangle, first turn your triangle into a rectangle.



Next, find the area of the rectangle. $6 \cdot 3 = 18$ square units

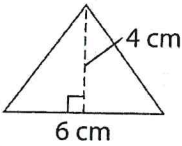
The triangle is half the area of the formed rectangle or $A = \frac{1}{2}bh$, so divide the product by 2.

$18 \div 2 = 9$ So, the area of the triangle is 9 square units.

Don't forget to square the units in the answer!

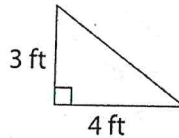
Find the area of each triangle.

1.



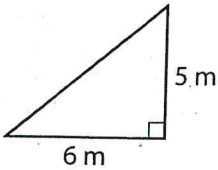
Worked two ways

2.



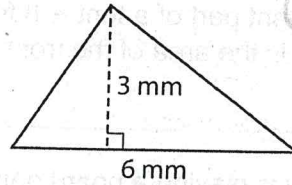
$A = \frac{1}{2}bh$ $\frac{1}{2}(4)(3) = \frac{1}{2}(12) = 6 \text{ ft}^2$

3.



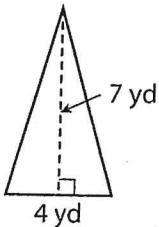
$A = \frac{1}{2}(6)(5) = 3(5) = 15 \text{ m}^2$

4.



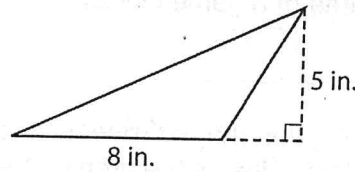
$A = \frac{1}{2}(6)(3) = 3(3) = 9 \text{ mm}^2$

5.



$A = \frac{1}{2}(4)(7) = \frac{1}{2}(28) = 14 \text{ yd}^2$

6.



$A = \frac{1}{2}(8)(5) = 4(5) = 20 \text{ in}^2$

Two ways to solve:

$A = \frac{1}{2} \cdot (6)(4)$
multiply then divide by 2 OR
 $\frac{1}{2}(24) = 12 \text{ cm}^2$

$A = \frac{1}{2} \cdot (6)(4)$
divide one number by 2, then mult.
 $\frac{1}{2}(6) = 3(4) = 12 \text{ cm}^2$
 $\frac{1}{2}$ of 6 is 3.

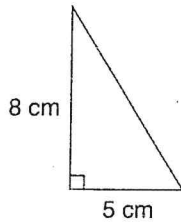
LESSON
13-2

Area of Triangles

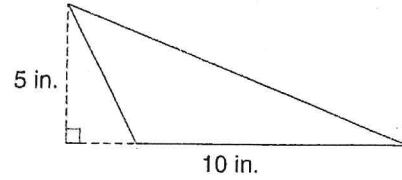
Practice and Problem Solving: A/B

Find the area of each triangle.

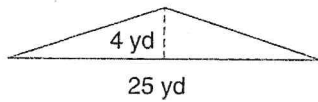
1.



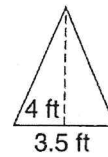
2.



3.

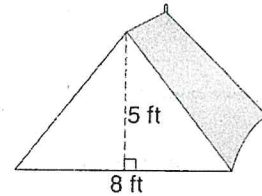


4.



Solve.

5. The front part of a tent is 8 feet long and 5 feet tall. What is the area of the front part of the tent?



6. Kathy is playing a board game. The game pieces are each in the shape of a triangle. Each triangle has a base of 1.5 inches and a height of 2 inches. What is the area of a game piece?

7. A triangular-shaped window has a base of 3 feet and a height of 4 feet. What is the area of the window?

8. Landon has a triangular piece of paper. The base of the paper is $6\frac{1}{2}$ inches. The height of the paper is 8 inches. What is the area of the piece of paper?

LESSON
13-2

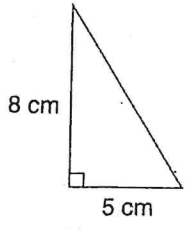
Area of Triangles

Practice and Problem Solving: A/B

$A = \frac{1}{2}bh$

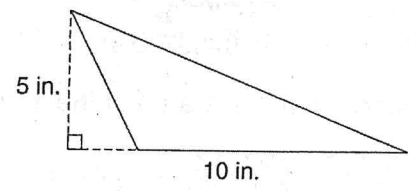
Find the area of each triangle.

1.



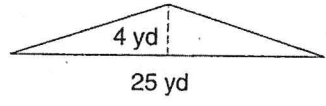
$A = \frac{1}{2}(5)(8) = \frac{1}{2}(40) = 20 \text{ cm}^2$

2.



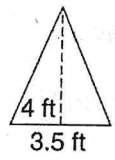
$A = \frac{1}{2}(10)(5) = \frac{1}{2}(50) = 25 \text{ in}^2$

3.



$A = \frac{1}{2}(25)(4) = 2(25) = 50 \text{ yd}^2$

4.



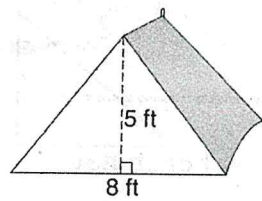
$A = \frac{1}{2}(3.5)(4) = 2(3.5) = 7 \text{ ft}^2$

two different ways.

Solve.

5. The front part of a tent is 8 feet long and 5 feet tall. What is the area of the front part of the tent?

$A = \frac{1}{2}(8)(5) = 4(5) = 20 \text{ ft}^2$



6. Kathy is playing a board game. The game pieces are each in the shape of a triangle. Each triangle has a base of 1.5 inches and a height of 2 inches. What is the area of a game piece?

$A = \frac{1}{2}(1.5)(2) = \frac{1}{2}(3) = 1.5 \text{ in}^2$

7. A triangular-shaped window has a base of 3 feet and a height of 4 feet. What is the area of the window?

$A = \frac{1}{2}(3)(4) = 3(2) = 6 \text{ ft}^2$

8. Landon has a triangular piece of paper. The base of the paper is $6\frac{1}{2}$ inches. The height of the paper is 8 inches. What is the area of the piece of paper?

$A = \frac{1}{2}(6\frac{1}{2})(8) = 6\frac{1}{2}(4) = 26 \text{ in}^2$

$A = \frac{1}{2}(6.5)(8) = 6.5(4) = 26 \text{ in}^2$

LESSON
13-1

Area of Quadrilaterals

Reteach

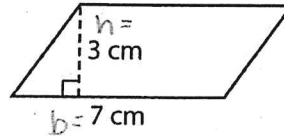
Substitute and solve!

You can use formulas to find the areas of quadrilaterals.

The area A of a **parallelogram** is the product of its base b and its height h .

$$A = bh$$

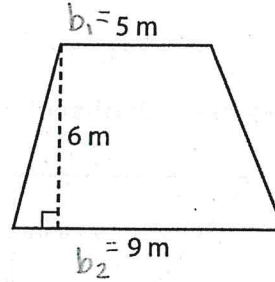
$$\begin{aligned} A &= bh \\ &= 3 \cdot 7 \\ &= 21 \text{ cm}^2 \end{aligned}$$



The area of a **trapezoid** is half its height multiplied by the sum of the lengths of its two bases.

$$A = \frac{1}{2}h(b_1 + b_2)$$

$$\begin{aligned} A &= \frac{1}{2}h(b_1 + b_2) \\ &= \frac{1}{2} \cdot 6(5 + 9) \\ &= \frac{1}{2} \cdot 6(14) \\ &= 3 \cdot 14 \\ &= 42 \text{ m}^2 \end{aligned}$$

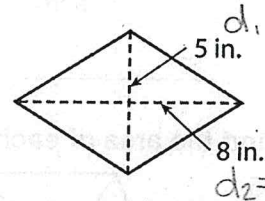


b_1 = just both bases.
 b_2 = 5 and 9 for this problem.

The area of a **rhombus** is half of the product of its two diagonals.

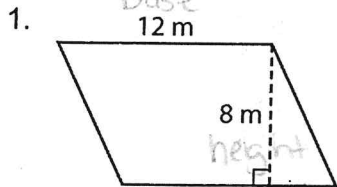
$$A = \frac{1}{2}d_1d_2$$

$$\begin{aligned} A &= \frac{1}{2}d_1d_2 \\ &= \frac{1}{2}(5)(8) \\ &= 20 \text{ in.}^2 \end{aligned}$$

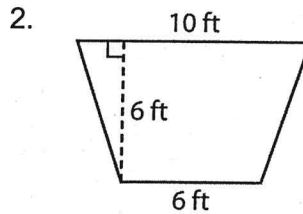


d_1 = both diagonals
 d_2 =

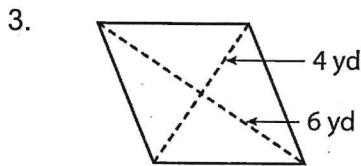
Find the area of each figure.



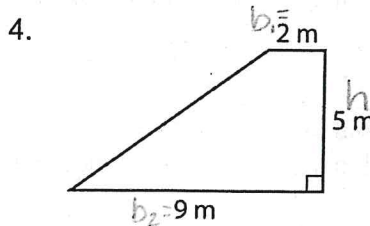
$$A = bh \quad A = 12(8) \quad A = 96 \text{ m}^2$$



$$A = \frac{1}{2}h(b_1 + b_2) = \frac{1}{2}(6)(10 + 6) = 3(16) = 48 \text{ ft}^2$$



$$A = \frac{1}{2}(4)(6) = \frac{1}{2}(24) = 12 \text{ yd}^2$$



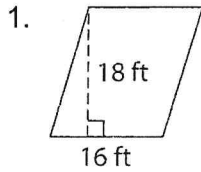
$$A = \frac{1}{2}(5)(2 + 9) = 2.5(11) = 27.5 \text{ m}^2$$

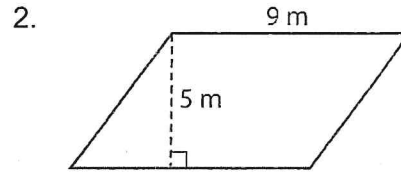
LESSON
13-1

Area of Quadrilaterals

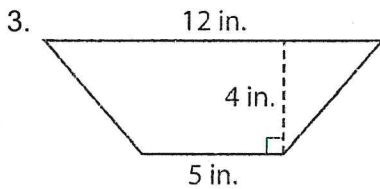
Practice and Problem Solving: A/B

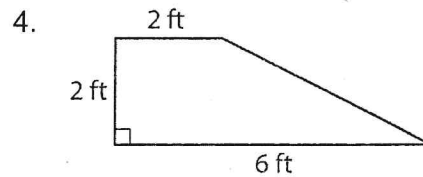
Find the area of each parallelogram.



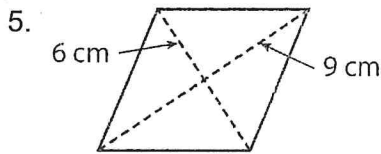


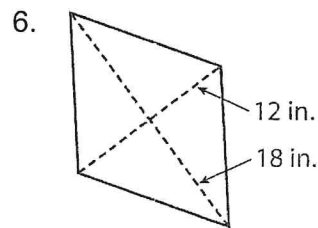
Find the area of each trapezoid.





Find the area of each rhombus.





Solve.

7. A desktop in the shape of a parallelogram has a base of 30 inches and a height of 40 inches. What is the area of the desktop?

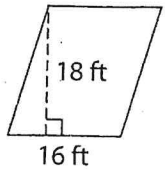
8. A rhombus has one diagonal that is 14 centimeters long and one diagonal that is 12 centimeters long. What is the area of the rhombus?

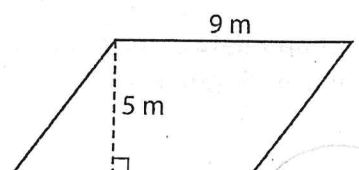
9. The bases of a trapezoid are 24 feet and 16 feet. The height of the trapezoid is 12 feet. What is the area of the trapezoid?

LESSON 13-1 Area of Quadrilaterals

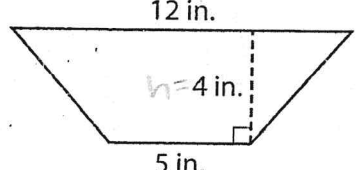
Practice and Problem Solving: A/B

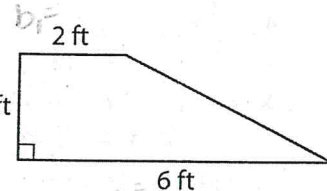
Find the area of each parallelogram.

1.  $A = bh$
 $A = 16(18) = 288 \text{ ft}^2$

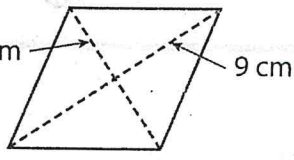
2. 
 $A = (9)(5) = 45 \text{ m}^2$

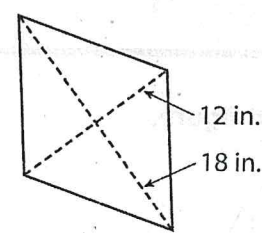
Find the area of each trapezoid.

3. 
 $A = \frac{1}{2}(4)(12+5) = \frac{1}{2}(4)(17)$

4. 
 $A = \frac{1}{2}(2)(6+2) = \frac{1}{2}(2)(8)$

Find the area of each rhombus.

5. 
 $A = \frac{1}{2}(6)(9) = 3(9) = 27 \text{ cm}^2$

6. 
 $A = \frac{1}{2}(12)(18) = 6(18) = 108 \text{ in}^2$

Solve.

7. A desktop in the shape of a parallelogram has a base of 30 inches and a height of 40 inches. What is the area of the desktop?

$A = h(h)$
 $A = (30)(40) = 1200 \text{ in}^2$

8. A rhombus has one diagonal that is 14 centimeters long and one diagonal that is 12 centimeters long. What is the area of the rhombus?

$A = \frac{1}{2}(d_1)(d_2)$
 $A = \frac{1}{2}(14)(12) = 7(12) = 84 \text{ cm}^2$

9. The bases of a trapezoid are 24 feet and 16 feet. The height of the trapezoid is 12 feet. What is the area of the trapezoid?

$A = \frac{1}{2}(h)(b_1 + b_2)$
 $A = \frac{1}{2}(12)(24+16) = \frac{1}{2}(12)(40) = 6(40) = 240 \text{ ft}^2$