Grade 6 Grade Level
Day 1

| | |
|---|---|
| **Standard** | *6.NS.4* Find common factors and multiples using two whole numbers.<br>a. Compute the greatest common factor (GCF) of two numbers both less than or equal to 100.<br>b. Compute the least common multiple (LCM) of two numbers both less than or equal to 12.<br>c. Express sums of two whole numbers, each less than or equal to 100, using the distributive property to factor out a common factor of the original addends. |
| **Learning Targets**<br>**I Can Statements** | I can identify each of the following: factors, multiples, LCM, and GCF. |
| **Essential Question(s)** | How can we use the LCM and the GCF to solve real-world problems? |
| **Resources** | No additional resources needed. However, all answers should be written on a separate sheet of paper. |
| **Learning Activities or Experiences** | 1. Complete at least 3 topics of your **ALEKS** pathway. (if available)<br>2. Review attached notes and complete the practice problems.<br>3. Complete the performance task titled "Thinking of Two Numbers".<br>4. Complete the "Today's Thought" activity. |

**Thinking of Two Numbers**

Jack and Jill are playing a game called "Guess My Numbers."

Jack: I am thinking of two numbers. Their *greatest common factor* (GCF) is 2. Their *least common multiple* (LCM) is 60.

Jill: Your numbers must be 10 and 12.

Is Jill right? If you agree with Jill, explain how you know these numbers, and only these numbers, work. If you disagree, find *all possible pairs* of numbers that Jack might be thinking of.

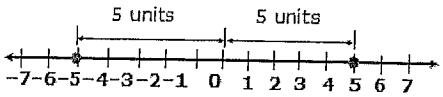
Grade 6 Grade Level
Day 2

| | |
|---|---|
| **Standard** | *6.NS.5* Understand that the positive and negative representations of a number are opposites in direction and value. Use integers to represent quantities in real-world situations and explain the meaning of zero in each situation. |
| **Learning Targets**<br>**I Can Statements** | I can identify a number's opposite and understand its distance away from zero on a number line. |
| **Essential Question(s)** | What are integers? How do integers connect with real world such as with altitude, temperature, and football? |
| **Resources** | No additional resources needed. However, all answers should be written on a separate sheet of paper. |
| **Learning Activities or Experiences** | 1. Complete at least 3 topics of your **ALEKS** pathway. (if available)<br>2. Review attached notes and complete the practice problems.<br>3. Complete the performance task titled "Integer Challenge".<br>4. Complete the "Today's Thought" activity. |

## 2-1 Integers

**Check It Out: Example 1**

Graph the integer –5 and its opposite on a number line.




*The opposite of -5 is 5.*




## 2-1 Integers

You can compare and order integers by graphing them on a number line. Integers increase in value as you move to the **right** along a number line. They decrease in value as you move to the **left**.

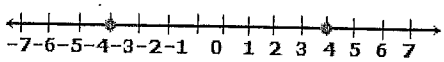



## 2-1 Integers

**Additional Example: Comparing Integers Using a Number Line**

**Compare the integers. Use < or >.**

4 ☐ -4




*4 is farther to the right than -4, so 4 > -4.*

**Remember!**

The symbol < means "is less than," and the symbol > means "is greater than."

# Task: Integer Challenge

**Directions:** Solve each exercise.

WRITING INTEGERS. Write a positive or negative integer that represents the situation.

1. A baseball is thrown at a speed of 78 miles per hour.
2. A submarine is 3750 feet below sea level.
3. Making a $25 payment on you cell phone bill

GRAPHING INTEGERS. Graph the integer and its opposite.

4. 8 
5. -7 
6. 11 

VOCABULARY. List four words or phrases used in real life that indicate negative integers.

7. _____
8. _____
9. _____
10. _____

## Grade 6 Math

## (General Ed and Accelerated)

## Day 4 and Day 5

| |
|---|
| **Standard: 6.GM.1** Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems. |
| **Learning Target(s):** I can: Derive the formulas for the area of a rectangle, square, triangle, parallelogram, and trapezoid. Use formulas to find the area of a rectangle, square, parallelogram, trapezoid, and triangle. Find the area of a polygon that can be separated into quadrilaterals and triangles. |
| **Essential Question(s):** How are the formulas for the area of a square, triangle, parallelogram, and trapezoid related to the formula for the area of a rectangle? What is a formula and how can it help you to find the areas of triangles and some quadrilaterals? |
| **Learning Activities:**<br>• Review Area Examples (Vocabulary Terms: area, base, height, parallelogram, square, trapezoid)<br>• Complete Area Coached Example (pg. 247)<br>• Complete Lesson Practice (pgs. 248-252)<br>• Complete Supplemental Activities<br>1. Area of a Triangle<br>2. Area of a Rectangle and Triangles<br>3. Area of an Irregular Shape<br>4. Area of Parallelogram<br>5. Area of a Trapezoid<br>• Complete 2 ALEKS topics |

A **square** is a rectangle with each side, $s$, the same length.

## Example 2

Find the area of a square that has sides 5 centimeters long.

**Strategy** Find a formula for the area of a square.

**Step 1** Use the formula for the area of a rectangle.

Let $s$ be the length of a side. Each side of a square has the same length, so the length and width are both $s$. Replace $l$ and $w$ with $s$.

Area of a rectangle: $A = l \times w$

Area of a square: $A = s \times s$ or $A = s^2$

**Step 2** Substitute 5 for $s$ in the formula.

$$A = s^2$$
$$= 5^2$$
$$= 5 \times 5$$
$$= 25$$

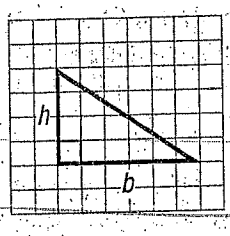
Because the sides are measured in centimeters, the area will be measured in square centimeters.

**Solution** The area of a square with sides 5 centimeters long is 25 $cm^2$.

The **base** and **height** of a right triangle are the perpendicular sides that form the right angle.

## Example 3

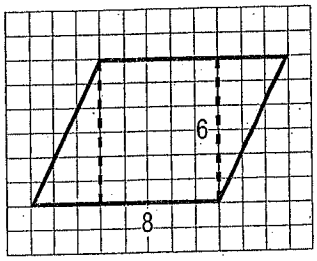
Find the area of the right triangle below.




**Strategy** Compose a rectangle and find its area.

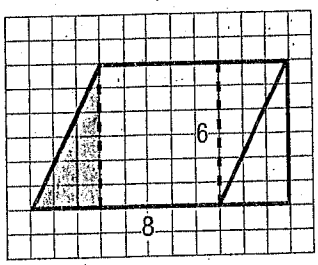
**Step 1** Count squares to label the base and height of the parallelogram.

Draw lines from the vertices perpendicular to the bases.




**Step 2** Rearrange the parts of the parallelogram.

Move the shaded triangle to the right to form a rectangle.




**Step 3** Find the area of the rectangle formed by the rearranged pieces.

The length of the rectangle is the same as the base of the parallelogram, 8 units.

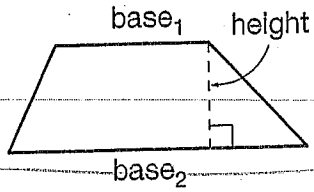
The width of the rectangle is the same as the height of the parallelogram, 6 units.

$A = lw = bh$

$A = 8 \times 6 = 48$ square meters

**Solution** **The area of the wall hanging is 48 square meters.**

A **trapezoid** is a quadrilateral that has one pair of parallel sides.




The parallel sides are its two bases. Its height is the perpendicular distance between the bases.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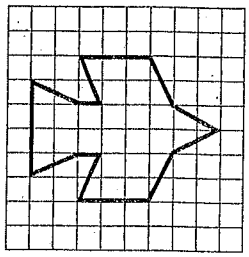
## 2 COACHED EXAMPLE

**Benny drew the top view of a paper airplane that he is designing. Each square on the grid represents 1 square inch. What is the area of the shape?**



Decompose Benny's drawing into a trapezoid, a rectangle, a triangle, and two parallelograms.

To find the area of the triangle, use the formula $A =$ _____.

Substitute _____ for $b$, and _____ for $h$.

$A = \frac{1}{2} \times$ _____ $\times$ _____

$=$ _____ square inches

To find the area of the rectangle, use the formula $A =$_____.

Substitute _____ for $l$, and _____ for $w$.

$A =$ _____ $\times$ _____

$=$ _____ square inches

To find the area of the trapezoid, use the formula $A =$ _____.

Substitute _____ for $b_1$, _____ for $b_2$, and _____ for $h$.

$A = \frac{1}{2}$(_____ + _____) _____

$= \frac{1}{2}$(_____) _____

$= \frac{1}{2} \times$ _____

$=$ _____ square inches

The parallelograms are _____.

To find the area of one of the parallelograms, use the formula $A =$_____.

$A =$ _____ $\times$ _____

$=$ _____

Then multiply the area by _____ to find the area of both parallelograms.

$2A = 2 \times$ _____

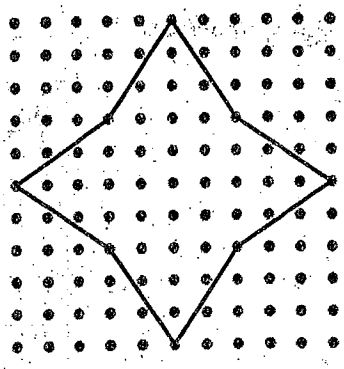
$=$ _____ square inches

To find the total area, add the areas of the figures.

_____ + _____ + _____ + _____ = _____ square inches

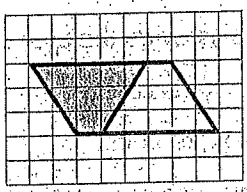
**The area of the shape is _____ square inches.**

4 Laurent drew a pattern on a sheet of dot paper.
He is going to cut out the pattern and fold it into a box.
Find the area of the outside of the box.



square units

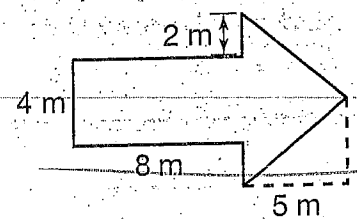
5 To find the area of the shaded trapezoid, Will copied it to compose the parallelogram.



Which statements describe correct reasoning? Mark all that apply.

- ○ **A.** Find the area of the trapezoid and divide it by 2.
- ○ **B.** The area of the parallelogram is twice the area of the trapezoid.
- ○ **C.** The first step is to copy the triangle.
- ○ **D.** Multiply the base times the height to find the area of the parallelogram.
- ○ **E.** The two trapezoids have the same area.

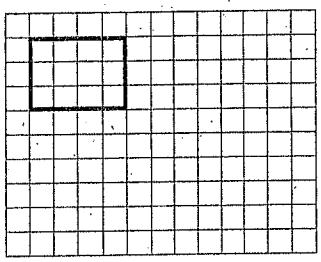
6 What is the area of the arrow in square meters? Use words, numbers, or drawings to explain your answer.



9 The stop sign is a regular octagon.


Show and describe a way that the octagon could be separated into parts to find its area.

10 Angela is making a rectangular quilt. Right now, it is 3 feet wide and 4 feet long. The final quilt will be twice as wide and twice as long.



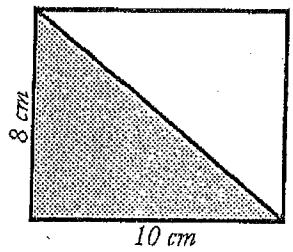
How many times greater will the area of the final quilt be than it is now? Explain your reasoning.

Name: _____

# Area of Rectangles & Triangles

**Area of a Triangle**
$\frac{1}{2} \times (b \times h) = A$
To find the area of a triangle, multiply ½ x base x height.

**Area of a Rectangle**
$l \times w = A$
To find the area of a rectangle, multiply length x width.

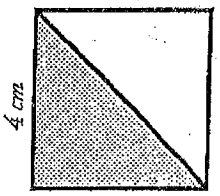



Area of the shaded triangle:
$b$ = 10 cm
$h$ = 8 cm
½ x 10 cm x 8 cm = 40 $cm^2$

Area of the rectangle:
$l$ = 10 cm
$w$ = 8 cm
10 cm x 8 cm = 80 $cm^2$

Find the area of each rectangle and shaded triangle.

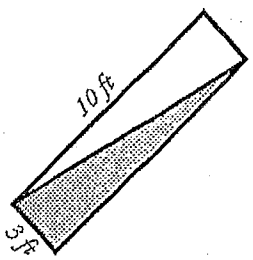
a.




area of the square = _____

area of the triangle = _____

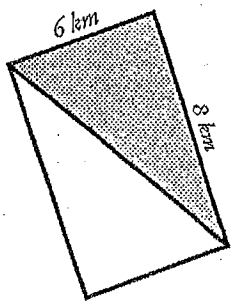
b.




area of the rectangle = _____

area of the triangle = _____

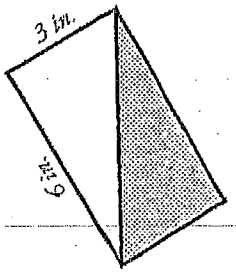
c.




area of the rectangle = _____

area of the triangle = _____

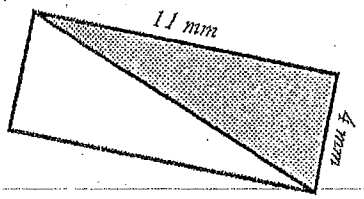
d.




area of the rectangle = _____

area of the triangle = _____

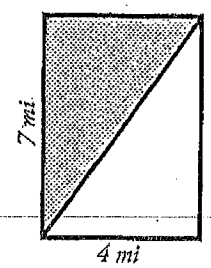
e.




area of the rectangle = _____

area of the triangle = _____

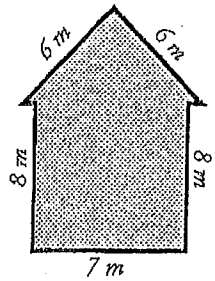
f.




area of the rectangle = _____

area of the triangle = _____

**Challenge:** Find the area of the polygon. Use the back if you need work space.



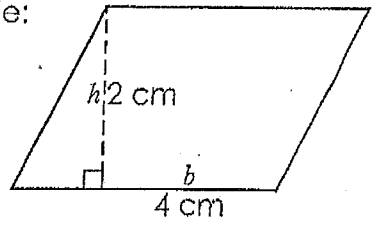

_____

Name: _____

# Area of a Parallelogram

The formula for finding the area of a parallelogram is **Area = base × height.**
This is written as **$A = bh$.**

Example:

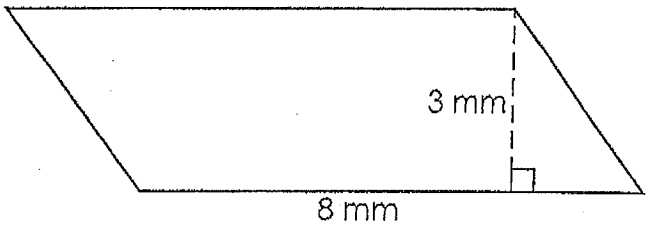



$A = bh$

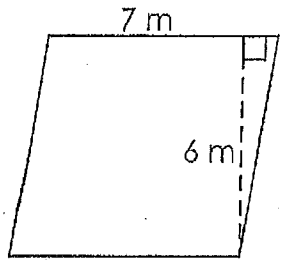
$A = 4\text{ cm}(2\text{ cm})$

$A = 8\text{ cm}^2$

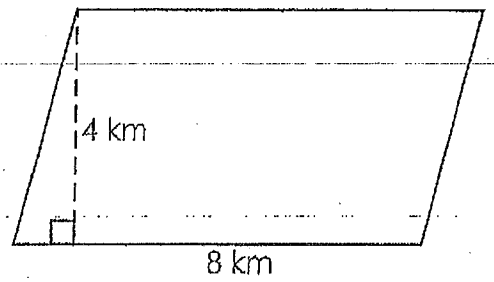
Find the areas of the parallelograms.



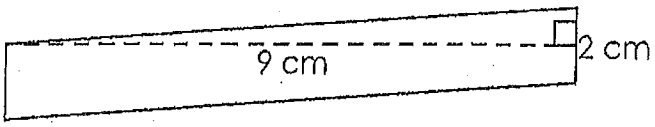

A = _____




A = _____




A = _____




A = _____

## Grade 6 Math

## (General Ed and Accelerated)

## Day 6 and Day 7

| |
|---|
| **Standard: 6.GM.2** Use visual models (e.g., model by packing) to discover that the formulas for the volume of a right rectangular prism ($V = lwh$, $V = Bh$) are the same for whole or fractional edge lengths. Apply these formulas to solve real-world and mathematical problems. |
| **Learning Target(s):** I can: Derive the formula for the volume of a right rectangular prism. Use the formula to find the volumes of right rectangular prisms with whole number and fractional edge lengths. Find the missing length, width, or height of a right rectangular prism given its volume. |
| **Essential Question(s):** How does using a formula to find the volume of a rectangular prism compare to using a formula to find the missing dimension of a rectangular prism? What is the relationship between the two formulas for the volume of a rectangular prism? How is using a formula to find the volume of a rectangular prism similar to using a formula to find the area of a rectangle? How is it different? |
| **Learning Activities:**<br>• Review Volume Examples (Vocabulary Terms: cubic unit, rectangular prism, volume)<br>• Complete Volume Coached Example (pg. 256)<br>• Complete Lesson Practice (pgs. 257-260)<br>• Complete Supplemental Activities<br>1. Volume of a Rectangular Prism<br>• Complete 2 ALEKS topics |

**Step 2** Find the number of cubes that cover the bottom layer of the box.

The bottom layer is a rectangle. Multiply the number of rows by the number of cubes in each row to find the number of cubes in the base. This is the same as multiplying the length by the width.

Area of base = length × width

$$B = l \times w$$
$$= 6 \times 4$$
$$= 24 \text{ cubes}$$

**Step 3** Find the number of cubes in 5 layers.

Multiply the number of cubes in the base layer by the number of layers to find the volume of the box. This is the same as multiplying the area of the base by the height.

$$V = Bh$$
$$= 24 \times 5$$
$$= 120 \text{ cm}^3$$

**Solution** **Leslie can use the formula $V = Bh$ or $V = lwh$ to find the volume of the box.**

## Example 2

Joan's closet is 6 feet long, 2 feet wide, and 7 feet high. What is the volume of Joan's closet?

**Strategy** **Use a formula for the volume of a rectangular prism.**

**Step 1** Write the formula.

The length, width, and height of the closet are given.
So, use the formula $V = lwh$.

**Step 2** Substitute the dimensions for length, width, and height into the formula and simplify.

Let $l = 6$, $w = 2$, and $h = 7$.

$$V = lwh$$
$$= 6 \times 2 \times 7$$
$$= 84$$

Since the dimensions are given in feet, the volume is in cubic feet.

**Solution** **Joan's closet has a volume of 84 ft$^3$.**

## 2 COACHED EXAMPLE

**A rectangular prism has a volume of 7,168 $cm^3$. Its base has an area of 512 $cm^2$. What is its height?**

Write the formula for finding the volume of a rectangular prism using its base and height.

$V =$ _____ × _____

Write the given measurements.

_____ $= 7{,}168\ cm^3$

_____ $= 512\ cm^2$

Substitute these measurements into the formula.

_____ = _____ $h$

To find the height, _____ both sides of the equation by _____.

$$\frac{7{,}168}{\square} = \frac{\square h}{\square}$$

_____ $= h$

**The height of the rectangular prism is _____ centimeters.**

6. The base of a rectangular prism is 270 $m^2$. The volume is 2,430 $m^3$. The formula for finding the volume of a rectangular prism is $V = Bh$. What is the height of the rectangular prism in meters?

_____ meters

7. Complete this table to show the measurements of the cargo holds of three different moving trucks.

| | Length | Width | Height | Volume |
|---|---|---|---|---|
| Truck A | 14 ft | | 7 ft | 784 $ft^3$ |
| Truck B | | 6 ft | 6 ft | 324 $ft^3$ |
| Truck C | 24 ft | 7 ft | 8 ft | |

8. A chest of drawers has 2 smaller drawers that are 351 square inches on the bottom and 5 inches deep. It has 3 larger drawers that are 351 square inches on the bottom and 7 inches deep.

What is the total volume for all of the drawers in cubic inches? Use words, numbers, or models to explain your answer.

12 A building block is shaped like a cube and has side lengths of $1\frac{1}{2}$ inches. Jada arranged 48 of them into a rectangular prism.

**Part A**

What are possible measurements of the rectangular prism?

**Part B**

Explain how you found the measurements.

**Part C**

What is the volume of the rectangular prism in cubic inches? Explain how you found your answer.

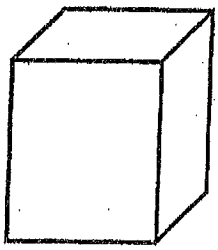
Name: _____

# Volume of Rectangular Prisms

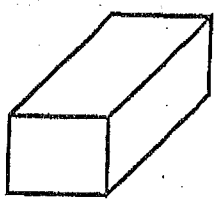
Zoe paints small wooden boxes and places her gemstones in them. The table below shows the dimensions of each box. Find the volume for each box.

| box color | length | width | height | volume |
|---|---|---|---|---|
| green box | 9 cm | 6 cm | 2 cm | |
| yellow box | 2 cm | 4 cm | 7 cm | |
| orange box | 3 cm | 5 cm | 5 cm | |
| brown box | 8 cm | 4 cm | 3 cm | |
| red box | 4 cm | 6 cm | 7 cm | |
| blue box | 2 cm | 5 cm | 8 cm | |

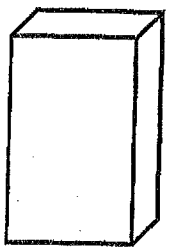
Color each box the correct color.

a. 

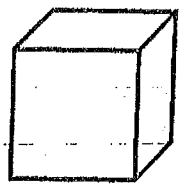
volume = 168 $cm^3$

b. 

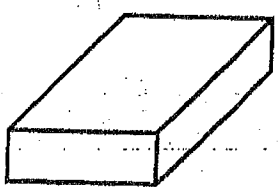
volume = 96 $cm^3$

c. 

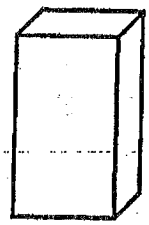
volume = 80 $cm^3$

d. 

volume = 75 $cm^3$

e. 

volume = 108 $cm^3$

f. 

volume = 56 $cm^3$

g. Zoe also has a black box. It is 14 cm tall, 3 cm deep, and 2 cm wide. What is the volume of this box?

_____

LESSON 27

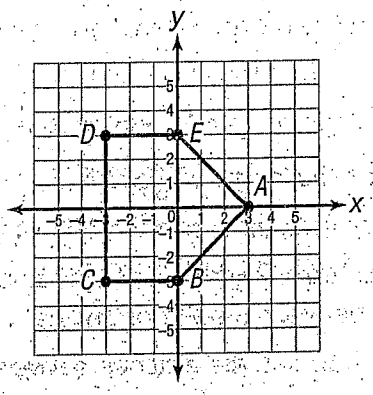
# Drawing Polygons in the Coordinate Plane

## 1 GETTING THE IDEA

The following points represent the vertices of a polygon.

$A(3, 0)$, $B(0, -3)$, $C(-3, -3)$, $D(-3, 3)$, and $E(0, 3)$

To draw the polygon, plot the points on a coordinate plane. Connect the points in order and then connect point $E$ to point $A$ to form the polygon.




The polygon has 5 sides, so it is a pentagon. Using the names of the vertices in order, we can name it pentagon *ABCDE*.

The coordinates of the vertices can be used to describe other properties of the figure.

- Side $CD$ is a vertical line since point $C$ and point $D$ have the same $x$-coordinate.
- Side $DE$ is a horizontal line since point $D$ and point $E$ have the same $y$-coordinate.
- Side $CB$ is a horizontal line since point $C$ and point $B$ have the same $y$-coordinate.
- Sides $DE$ and $CB$ both have a length of 3 units, so the sides are the same length.

## Example 2

Kirsten is planting a flower garden in the shape of a right triangle in one corner of her backyard. She draws a triangle on a coordinate plane with vertices $D(-2, -1)$, $E(-2, 4)$, and $F(3, 4)$. Each unit on the coordinate plane represents 1 foot. Verify that her drawing shows a right triangle. Then find the base and height of the flower garden.

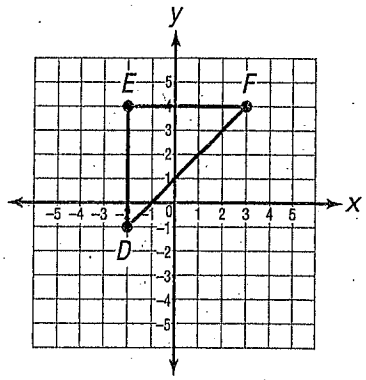
**Strategy** Plot the vertices on a coordinate plane.

**Step 1** Plot the vertices on the coordinate plane. Classify the figure.

Plot the locations of the vertices $D(-2, -1)$, $E(-2, 4)$, and $F(3, 4)$.

Then connect the points.

The figure is a triangle. Side $EF$ is the horizontal base and side $DE$ is the vertical height. Angle $E$ is a right angle, so the figure is a right triangle.




**Step 2** Find the length of the base, $EF$.

To find the horizontal distance between point $E$ and point $F$, use the $x$-coordinates.

The $x$-coordinate of point $E$ is $-2$. $|-2| = 2$

The $x$-coordinate of point $F$ is 3. $|3| = 3$

Since the points are in different quadrants, add to find the distance.

$2 + 3 = 5$ units

Each unit on the grid represents 1 foot, so the length represents 5 feet.

**Step 3** Find the height, $DE$.

To find the vertical distance between point $D$ and point $E$, use the $y$-coordinates.

The $y$-coordinate of point $D$ is $-1$. $|-1| = 1$

The $y$-coordinate of point $E$ is 4. $|4| = 4$

Since the points are in different quadrants, add to find the distance.

$1 + 4 = 5$ units

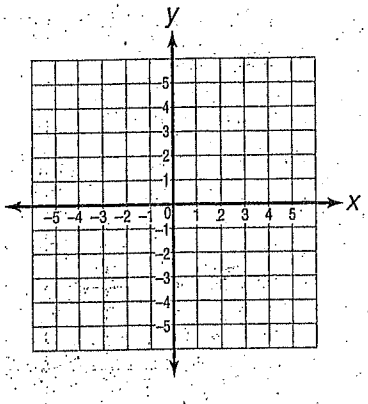
Each unit on the grid represents 1 foot, so the length represents 5 feet.

**Solution** The drawing shows a right triangle. Both the base and height are 5 feet.

## 2 COACHED EXAMPLE

**Jackson is drawing a map of his classroom. The classroom is in the shape of a rectangle. He draws three vertices at $A(-4, 1)$, $B(3, 1)$, and $C(3, -4)$. Determine the coordinates where Jackson should plot point $D$.**

Plot the given vertices. Connect the points to draw two sides of the rectangle.




Use properties of a rectangle to find the location of point $D$.

A rectangle has opposite sides that are parallel and have the same _____.

In the rectangle, side $CD$ will have the same length as side _____.

Find the length of side $AB$.

To find the horizontal distance, use the _____-coordinates.

The $x$-coordinate of point $A$ is _____. $|\_\_\_\_| = \_\_\_\_$

The $x$-coordinate of point $B$ is _____. $|\_\_\_\_| = \_\_\_\_$

Since the points are in different quadrants, _____ to find the distance.

_____ + _____ = _____ units

The length of $AB$ is _____ units. So, the length of _____ must also be _____ units.

Find the coordinates of point $D$.

To graph point $D$, start at point $C$ and move _____ units to the left.

The coordinates of point $D$ are (_____, _____).

Point $D$ has the same $x$-coordinate as point _____ and the same $y$-coordinate as point _____.

Check the answer.

In the rectangle, side $AD$ will have the same length as side _____.

To find the vertical distance, use the _____-coordinates.

The $y$-coordinate of point $B$ is _____. $|\_\_\_\_| = \_\_\_\_$

The $y$-coordinate of point $C$ is _____. $|\_\_\_\_| = \_\_\_\_$

Since the points are in different quadrants, _____ to find the distance.

_____ + _____ = _____ units

The length of $BC$ is _____ units.

The length of $AD$ is _____ units.

**The coordinates of point $D$ are _____.**

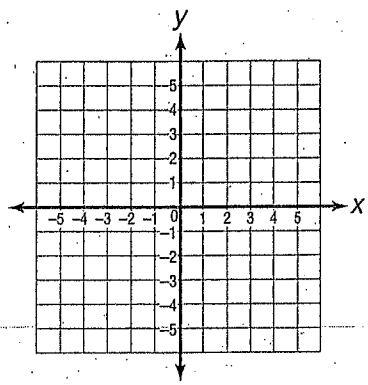
**4** A polygon has vertices at (−5, 3), (−2, 2), (−2, −2), and (−5, −3). Which statements describe the polygon? Mark all that apply.

- ○ **A.** The figure is a quadrilateral.
- ○ **B.** Opposite sides have the same length.
- ○ **C.** One pair of opposite sides is parallel.
- ○ **D.** Two pairs of opposite sides are parallel.
- ○ **E.** Two sides are vertical.
- ○ **F.** Two sides are horizontal.

**5** A square has vertices (0, −1), (0, 3), and (4, −1). What ordered pair represents the missing vertex?

**6** Plot the following points on the coordinate plane. Connect the points in order and then connect point *D* to point *A* to form a polygon.

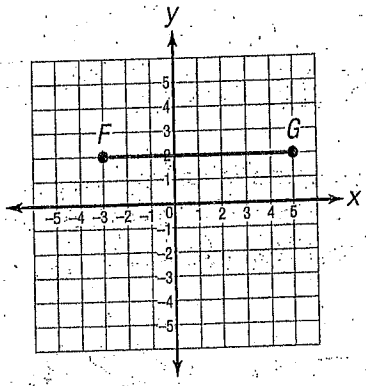
*A*(−2, −2), *B*(3, −2), *C*(2, −4), *D*(−4, −4)




**7** A vertex of a polygon is located at *A*(2, 1). The length of side *AB* is 4 units. Indicate whether each ordered pair could be the coordinates for point *B*.

| | (5, 1) | (−2, 1) | (2, −3) | (−2, 5) |
|---|---|---|---|---|
| Could be Point *B* Coordinates | ○ | ○ | ○ | ○ |
| Could Not be Point *B* Coordinates | ○ | ○ | ○ | ○ |

11 Line segment *FG* is a side of right triangle *FGH*. The length of *GH* is 2 units and angle *G* is a right angle.




**Part A**

What are all of the possible coordinates for point *H*? Use words, numbers, or models to explain your answer.

**Part B**

What is the area of triangle *FGH*? Use words, numbers, or models to explain your answer.

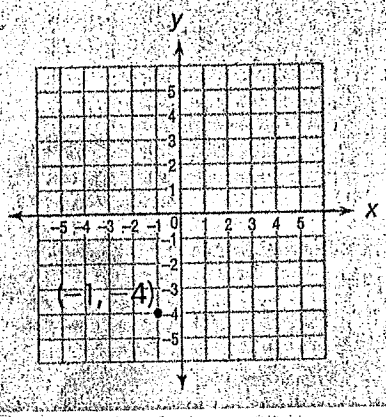

**B** You can plot ordered pairs from a table.

**DO** Write ordered pairs and plot the points.

| x | −1 | −1 | −1 |
|---|---|---|---|
| y | −4 | 1 | 3 |

1. Write ordered pairs from the values in the table.
2. For each point, start at the origin.
3. Move along the x-axis and then the y-axis to plot the point.
4. Label the point.

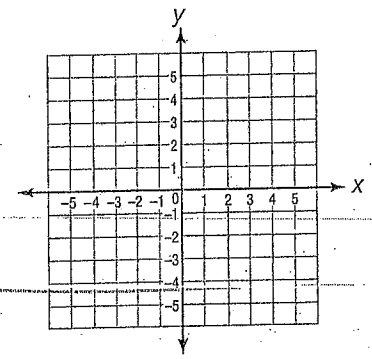
The ordered pairs are (−1, −4), (_____, _____), and (_____, _____).



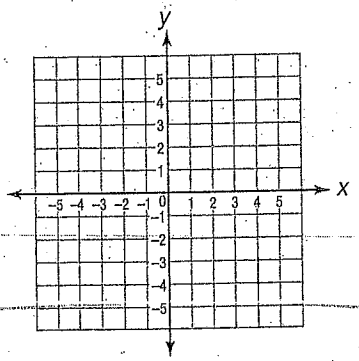

# PRACTICE

**Plot the points on the coordinate grid.**

**1** (4, −2), (1, 3)




**2** (0, −1), (−3, 4)

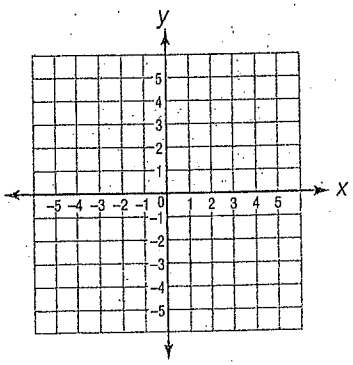



**Write ordered pairs and plot the points.**

**3**

| x | −2 | 0 | 4 |
|---|---|---|---|
| y | 4 | 4 | 0 |

The ordered pairs are (_____, _____), (_____, _____), and (_____, _____).




**B** You can find the distance between points by using absolute value.

**DO** Find the distance between points (2, 6) and (2, −4).

1. Decide if the points lie on the same line.
2. Find the distance of each point from the *x*-axis by finding the absolute values of the *y*-coordinates.
3. Add the absolute values to find the distance between the points.

The ___x___-coordinates are the same,

so the points lie on the same _____ line.

$|6| =$ _____ $|-4| =$ _____

The distance from (2, 6) to the *x*-axis is _____ units.

The distance from (2, −4) to the *x*-axis is _____ units.

_____ + _____ = _____

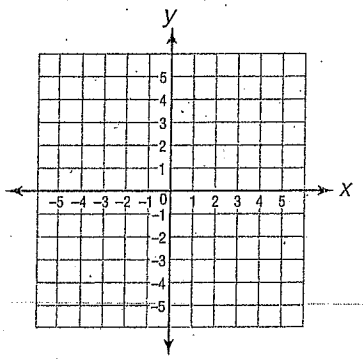
The distance between the points is _____ units.

**DISCUSS** Whitney said the distance between two points with coordinates (−11, 4) and (−6, 4) was 17 units. Do you agree or disagree? Explain.

## PRACTICE

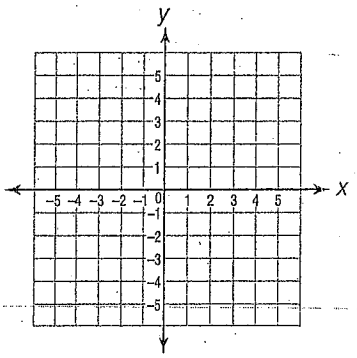
**Plot the pair of points and find the distance between them.**

**1** (3, −2) and (3, 5)




The distance is _____ units.

**2** (4, 2) and (−2, 2)




The distance is _____ units.

**Find the distance between the points.**

**3** (10, 6) and (−2, 6)

The distance is _____ units.

**4** (3, 7) and (3, 15)

The distance is _____ units.

**5** (0, −9) and (0, −2)

The distance is _____ units.

**6** (−4, 11) and (0, 11)

The distance is _____ units.