School-Home Letter

Vocabulary

area The number of square units needed to cover a figure.

parallelogram A quadrilateral whose opposite sides are parallel and congruent.

regular polygon A polygon in which all sides are congruent and all angles are congruent.

trapezoid A quadrilateral with exactly one pair of parallel sides.

Dear Family,

Throughout the next few weeks, our math class will be learning about area of parallelograms, triangles, trapezoids, regular polygons, and composite figures. We will also be learning how the area of a figure changes when the figure's dimensions change.

You can expect to see homework in which students use formulas to find the area of a variety of figures.

Here is a sample of how your child was taught to find the area of a trapezoid.

🔑 MODEL Solve Area Problems

Find the area of the trapezoid.

1.8 cm
1.2 cm
3.2 cm

Tips

Changing Dimensions

When you multiply all dimensions of a figure by a number, the area is multiplied by the square of that number.
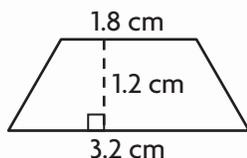
STEP 1

Write the formula.

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

STEP 2

Substitute 1.8 for b_1, 3.2 for b_2, and 1.2 for h.

$A = \frac{1}{2} \times (1.8 + 3.2) \times 1.2$

STEP 3

Add inside the parentheses. Then multiply.

$A = \frac{1}{2} \times 5 \times 1.2$

$A = 3$

So, the area is 3 cm².

Activity

Using a ruler, work together to construct a triangle that has an area of 8 square inches. There are many possible triangles. Sketch a triangle, and then use the area formula to check. If the area is not equal to 8 square inches, adjust the height and base as needed.

Carta para la casa

Vocabulario

área El número de unidades cuadradas necesarias para cubrir una figura.

paralelogramo Un cuadrilátero cuyos lados opuestos son paralelos y congruentes.

polígono regular Un polígono en quel todos los lados son congruentes y todos los ángulos son congruentes.

trapecio Un cuadrilátero con exactamente un par de lados paralelos.

Querida familia,

Durante las próximas semanas, en la clase de matemáticas aprenderemos sobre el área de paralelogramos, triángulos, trapecios, polígonos regulares y figuras compuestas. También aprenderemos a cómo cambia el área de una figura cuando cambian sus dimensiones.

Llevaré a la casa tareas en las que usaré fórmulas para hallar el área de distintas figuras.

Este es un ejemplo de la manera como aprenderemos a hallar el área de un trapecio.

🔑 MODELO Resolver problemas de área

Halla el área del trapecio.

1.8 cm
1.2 cm
3.2 cm
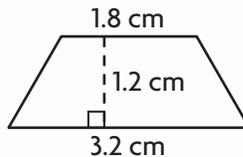
Pistas

Cambiar dimensiones

Cuando multiplicas todas dimensiones de una figura por un número, el área se multiplica por el cuadrado de ese número.

PASO 1

Escribe la fórmula.

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

PASO 2

Reemplaza la b_1 con 1.8, la b_2 con 3.2 y la h con 1.2.

$A = \frac{1}{2} \times (1.8 + 3.2) \times 1.2$

PASO 3

Suma los paréntesis. Luego multiplica.

$A = \frac{1}{2} \times 5 \times 1.2$

$A = 3$

Por tanto, el área es 3 cm^2.

Actividad

Usando una regla, trabajen juntos para construir un triángulo que tenga un área de 8 pulgadas cuadradas. Hay muchos triángulos posibles. Dibujen un triángulo, luego apliquen la fórmula para encontrar el área, para verificar. Si el área no es igual a 8 pulgadas cuadradas, ajusten la altura y la base según sea necesario.

Area of Parallelograms

COMMON CORE STANDARD—6.G.1
*Solve real-world and mathematical problems
involving area, surface area, and volume.*

Find the area of the figure.

1.

7 ft

18 ft

$A = bh$
$A = \textbf{18} \times \textbf{7}$
$A = \textbf{126 ft}^2$

2.

5 cm

7 cm
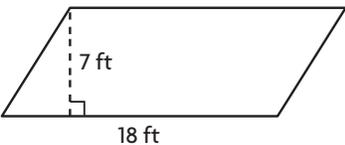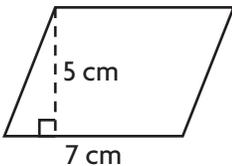
_____ cm^2

Find the unknown measurement for the figure.

3. square

$A =$ _____

$s = 9$ yd

4. parallelogram

$A = 247$ in.^{2}

$b = 19$ in.

$h =$ _____

5. parallelogram

$A = 9.18$ m^2

$b = 2.7$ m

$h =$ _____

6. parallelogram

$A = 8\frac{3}{4}$ yd^2

$b = 3\frac{1}{2}$ yd

$h =$ _____

7. parallelogram

$A = 0.2$ in.^{2}

$b =$ _____

$h = 0.4$ in.

8. parallelogram

$A =$ _____

$b = 4\frac{3}{10}$ m

$h = 2\frac{1}{10}$ m

9. square

$A =$ _____

$s = 35$ cm

10. parallelogram

$A = 6.3$ mm^2

$b =$ _____

$h = 0.9$ mm

Problem Solving · Real World

11. Ronna has a sticker in the shape of a
parallelogram. The sticker has a base of
6.5 cm and a height of 10.1 cm. What is
the area of the sticker?

_____

12. A parallelogram-shaped tile has an area
of 48 in.^{2}. The base of the tile measures
12 in. What is the measure of its height?

_____

Lesson Check (6.G.1, 6.EE.2c, 6.EE.7)

1. Cougar Park is shaped like a parallelogram and has an area of $\frac{1}{16}$ square mile. Its base is $\frac{3}{8}$ mile. What is its height?

2. Square County is a square-shaped county divided into 16 equal-sized square districts. If the side length of each district is 4 miles, what is the area of Square County?

Spiral Review (6.EE.5, 6.EE.8, 6.EE.9)

3. Which of the following values of y make the inequality $y < {}^-4$ true?

$y = {}^-4$ $y = {}^-6$ $y = 0$ $y = {}^-8$ $y = 2$

4. On a winter's day, 9°F is the highest temperature recorded. Write an inequality that represents the temperature t in degrees Fahrenheit at any time on this day.

5. In 2 seconds, an elevator travels 40 feet. In 3 seconds, the elevator travels 60 feet. In 4 seconds, the elevator travels 80 feet. Write an equation that gives the relationship between the number of seconds x and the distance y the elevator travels.

6. The linear equation $y = 4x$ represents the number of bracelets y that Jolene can make in x hours. Which ordered pair lies on the graph of the equation?

Name _____

Explore Area of Triangles

COMMON CORE STANDARD—6.G.1
Solve real-world and mathematical problems involving area, surface area, and volume.

Find the area of each triangle.

1.

10 ft

6 ft

30 ft^2

2.

37 cm

50 cm

3.

20 mm

40 mm

4.

30 in.

12 in.

5.

8 m

6 m

6.

18 in.

30 in.

7.

30 cm

15 cm

8.

2 in.

5 in.

9.

45 cm   20 cm

Problem Solving Real World
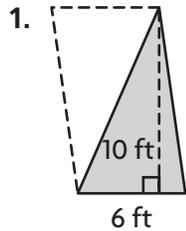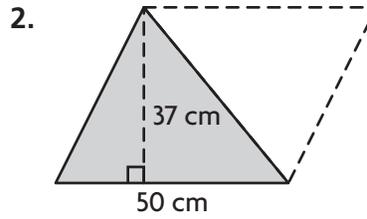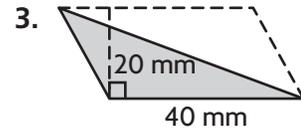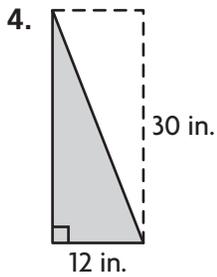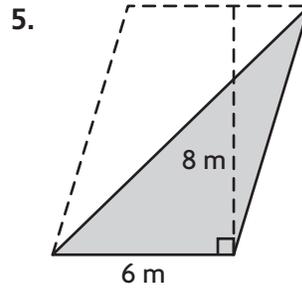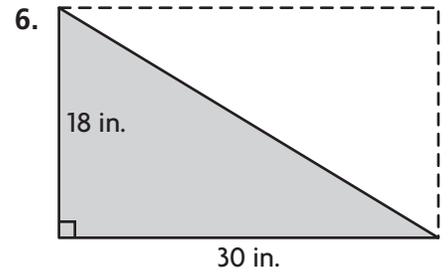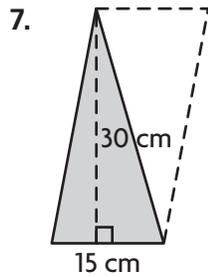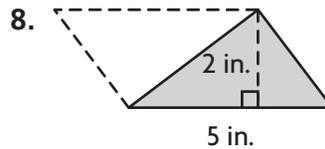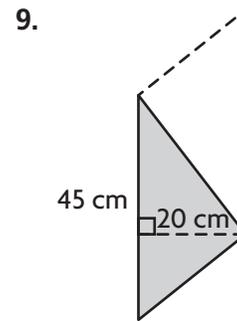
10. Fabian is decorating a triangular pennant for a football game. The pennant has a base of 10 inches and a height of 24 inches. What is the total area of the pennant?

11. Ryan is buying a triangular tract of land. The triangle has a base of 100 yards and a height of 300 yards. What is the area of the tract of land?

Lesson Check (6.G.1)

1. What is the area of a triangle with a height of 14 feet and a base of 10 feet?

2. What is the area of a triangle with a height of 40 millimeters and a base of 380 millimeters?

Spiral Review (6.EE.2c, 6.EE.7, 6.EE.8, 6.G.1)

3. Jack bought 3 protein bars for a total of $4.26. Which equation could be used to find the cost c in dollars of each protein bar?

4. Coach Herrera is buying tennis balls for his team. He can solve the equation $4c = 92$ to find how many cans c of balls he needs. How many cans does he need?

5. Sketch the graph of $y \leq {}^-7$ on a number line.

**6.** A square photograph has a perimeter of 20 inches. What is the area of the photograph?
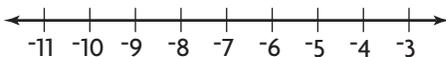
Name _____

Area of Triangles

COMMON CORE STANDARD—6.G.1
Solve real-world and mathematical problems involving area, surface area, and volume.

Find the area.

1.

6 in.

15 in.
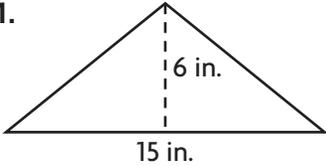
$A = \frac{1}{2}bh$

$A = \frac{1}{2} \times 15 \times 6$

$A = 45$

Area = 45 in.^{2}

2.

0.6 m

1.2 m

_____

3.

$2\frac{2}{3}$ ft

$4\frac{1}{2}$ ft

_____
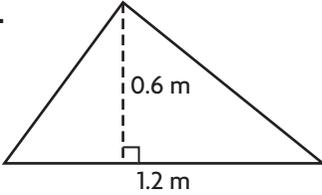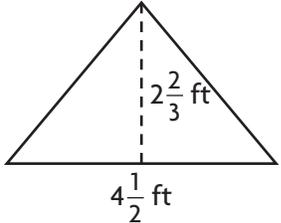
Find the unknown measurement for the triangle.

4. $A = 0.225$ mi^2

$b = 0.6$ mi

$h = $

_____

5. $A = 4.86$ yd^2

$b = $

$h = 1.8$ yd

_____

6. $A = 63$ m^2

$b = $

$h = 12$ m

_____

7. $A = 2.5$ km^2

$b = 5$ km

$h = $

_____

Problem Solving Real World

8. Bayla draws a triangle with a base of 15 cm and a height of 8.5 cm. If she colors the space inside the triangle, what area does she color?

_____

9. Alicia is making a triangular sign for the school play. The area of the sign is 558 in.^{2}. The base of the triangle is 36 in. What is the height of the triangle?

_____

Lesson Check (6.G.1, 6.EE.2c)

1. A triangular flag has an area of 187.5 square inches. The base of the flag measures 25 inches. How tall is the triangular flag?

2. A piece of stained glass in the shape of a right triangle has sides measuring 8 centimeters, 15 centimeters, and 17 centimeters. What is the area of the piece?

Spiral Review (6.EE.7, 6.EE.9, 6.G.1)

3. Tina bought a t-shirt and sandals. The total cost was $41.50. The t-shirt cost $8.95. The equation $8.95 + c = 41.50$ can be used to find the cost c in dollars of the sandals. How much did the sandals cost?

4. There are 37 paper clips in a box. Carmen places more paper clips in the box. Which equation models the total number of paper clips p in the box after Carmen places n more paper clips in the box?

5. Name another ordered pair that is on the graph of the equation represented by the table.

People in group, x	1	2	3	4
Total cost of ordering lunch special ($), y	6	12	18	24

6. Find the area of the triangle that divides the parallelogram in half.


13 cm

9 cm
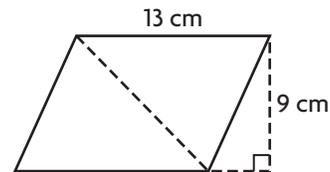
Name _____

Explore Area of Trapezoids

COMMON CORE STANDARD—6.G.1
Solve real-world and mathematical problems involving area, surface area, and volume.

1. Trace and cut out two copies of the trapezoid. Arrange the trapezoids to form a parallelogram. Find the areas of the parallelogram and the trapezoids using square units.
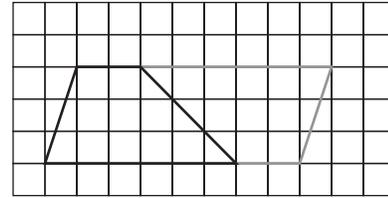
   parallelogram: 24 square units; trapezoids: 12 square units

Find the area of the trapezoid.

2. 9 in.
   7 in.
   2 in.

   _____ in.^{2}

3. 9 cm
   7 cm
   15 cm

   _____ cm^2

4. 12 mm
   10 mm
   16 mm

   _____ mm^2

5. 100 yd
   24 yd
   48 yd

   _____ yd^2

6. 17 m
   22 m
   30 m

   _____ m^2

7. 11.5 ft
   8 ft
   4.5 ft
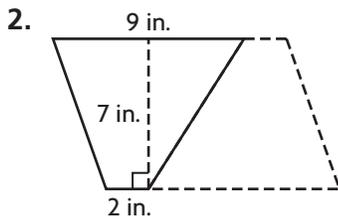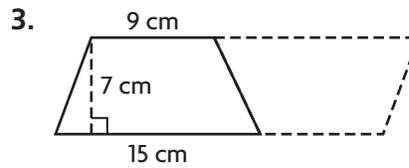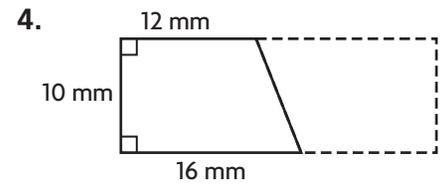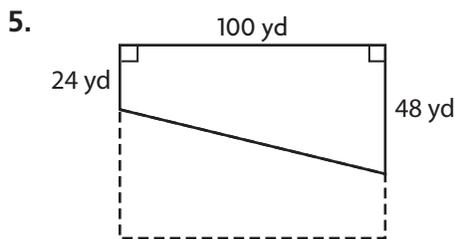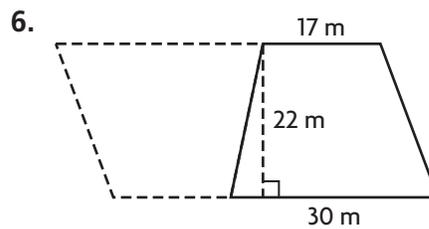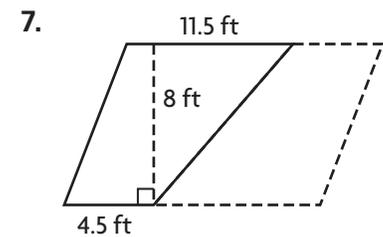
   _____ ft^2

Problem Solving *Real World*

8. A cake is made out of two identical trapezoids. Each trapezoid has a height of 11 inches and bases of 9 inches and 14 inches. What is the area of one of the trapezoid pieces?

   _____

9. A sticker is in the shape of a trapezoid. The height is 3 centimeters, and the bases are 2.5 centimeters and 5.5 centimeters. What is the area of the sticker?

   _____

Lesson Check (6.G.1)

1. What is the area of figure *ABEG*?

A   9 yd   B   C

7 yd

G   F   15 yd   E   D
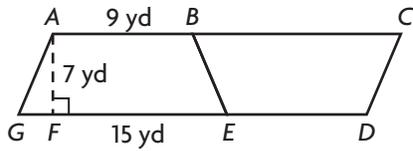
2. Maggie colors a figure in the shape of a trapezoid. The trapezoid is 6 inches tall. The bases are 4.5 inches and 8 inches. What is the area of the figure that Maggie colored?

Spiral Review (6.EE.2c, 6.EE.7, 6.EE.9, 6.G.1)

3. Cassandra wants to solve the equation $30 = \frac{2}{5}p$. What operation should she perform to isolate the variable?

4. Ginger makes pies and sells them for $14 each. Write an equation that represents the situation, if y represents the money that Ginger earns and x represents the number of pies sold.

5. What is the equation for the graph shown below?
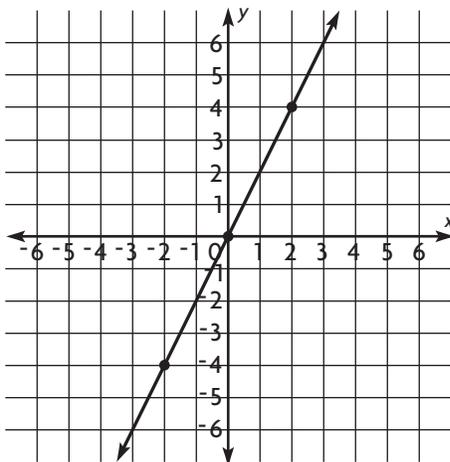
6. Cesar made a rectangular banner that is 4 feet by 3 feet. He wants to make a triangular banner that has the same area as the other banner. The triangular banner will have a base of 4 feet. What should its height be?

Name _____

Area of Trapezoids

COMMON CORE STANDARD—6.G.1
*Solve real-world and mathematical problems
involving area, surface area, and volume.*

**Find the area of the trapezoid.**

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

$A = \frac{1}{2} + (\underline{11} + \underline{17}) \times 18$

$A = \frac{1}{2} \times \underline{28} \times 18$

$A = \underline{252}\ \text{cm}^2$

11 cm

18 cm

17 cm

2.

5.5 ft

5 ft

6.5 ft

$A = $ _____

3.

0.2 cm

0.2 cm

0.6 cm

$A = $ _____

4.

10 in.

$2\frac{1}{2}$ in.

5 in.
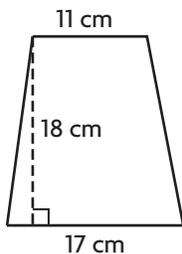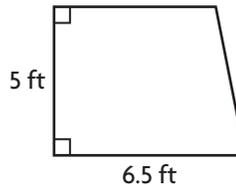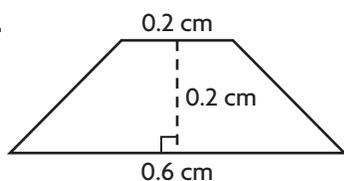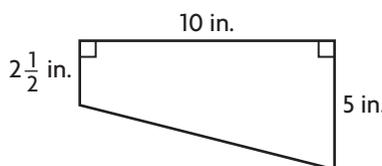
$A = $ _____

Find the height of the trapezoid.

5.

10 m

Area =
60.5 m²

h

1 m

$h = $ _____

6.

4.2 ft

Area = 79.2 ft²

h

9 ft

$h = $ _____

Problem Solving Real World
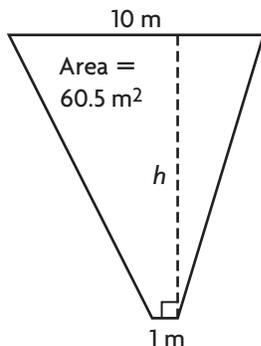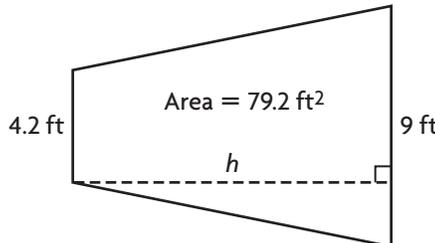
7. Sonia makes a wooden frame around a square picture. The frame is made of 4 congruent trapezoids. The shorter base is 9 in., the longer base is 12 in., and the height is 1.5 in. What is the area of the picture frame?

_____

8. Bryan cuts a piece of cardboard in the shape of a trapezoid. The area of the cutout is 43.5 square centimeters. If the bases are 6 centimeters and 8.5 centimeters long, what is the height of the trapezoid?

_____

Lesson Check (6.G.1, 6.EE.2c)

1. Dominic is building a bench with a seat in the shape of a trapezoid. One base is 5 feet. The other base is 4 feet. The perpendicular distance between the bases is 2.5 feet. What is the area of the seat?

2. Molly is making a sign in the shape of a trapezoid. One base is 18 inches and the other is 30 inches. How high must she make the sign so its area is 504 square inches?

Spiral Review (6.NS.6c, 6.RP.3d, 6.EE.2c)

3. Write these numbers in order from least to greatest.

$3\frac{3}{10}$ 3.1 $3\frac{1}{4}$

4. Write these lengths in order from least to greatest.

2 yards   5.5 feet   70 inches

5. To find the cost for a group to enter the museum, the ticket seller uses the expression $8a + 3c$ in which a represents the number of adults and c represents the number of children in the group. How much should she charge a group of 3 adults and 5 children?

6. Brian frosted a cake top shaped like a parallelogram with a base of 13 inches and a height of 9 inches. Nancy frosted a triangular cake top with a base of 15 inches and a height of 12 inches. Which cake's top had the greater area? How much greater was it?

Name _____

Area of Regular Polygons

Find the area of the regular polygon.

1.

7 mm

8 mm
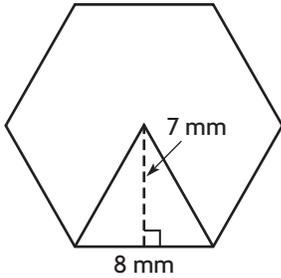
number of congruent triangles inside the figure: ____**6**____

area of each triangle: $\frac{1}{2}\times$ ____**8**____ $\times$ ____**7**____ = ____**28**____ mm^2

area of hexagon: ____**168 mm^2**____

2.

6.2 yd

9 yd

_____

3.

4 in.

3.3 in.

_____

4.

6 ft

3.9 ft

_____

5.

7 cm

5.8 cm

_____
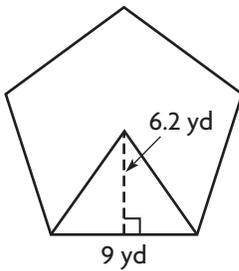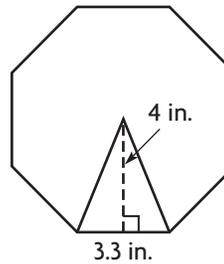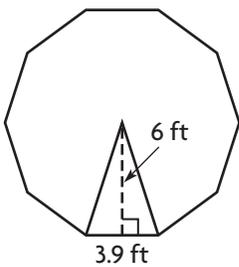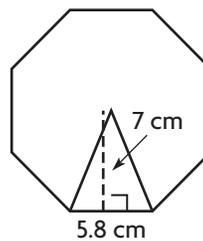
Problem Solving Real World

6. Stu is making a stained glass window in the shape of a regular pentagon. The pentagon can be divided into congruent triangles, each with a base of 8.7 inches and a height of 6 inches. What is the area of the window?

_____

7. A dinner platter is in the shape of a regular decagon. The platter has an area of 161 square inches and a side length of 4.6 inches. What is the area of each triangle? What is the height of each triangle?

_____

Lesson Check (6.G.1, 6.EE.2c)

1. What is the area of the regular hexagon?

3 m

$3\frac{2}{5}$ m
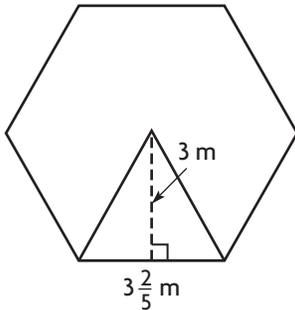
2. A regular 7-sided figure is divided into 7 congruent triangles, each with a base of 12 inches and a height of 12.5 inches. What is the area of the 7-sided figure?

## Spiral Review (6.EE.2c, 6.EE.5, 6.EE.9, 6.G.1)

3. Which inequalities have $b = 4$ as one of its solutions?

$2 + b \geq 2$ $3b \leq 14$

$8 - b \leq 15$ $b - 3 \geq 5$

4. Each song that Tara downloads costs $1.25. She graphs the relationship that gives the cost y in dollars of downloading x songs. Name one ordered pair that is a point on the graph of the relationship.

5. What is the area of triangle ABC?

A   B

10 ft

D   6 ft   C
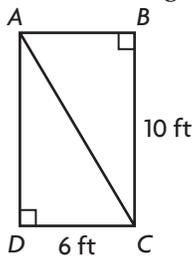
6. Marcia cut a trapezoid out of a large piece of felt. The trapezoid has a height of 9 cm and bases of 6 cm and 11 cm. What is the area of Marcia's felt trapezoid?

Name _____

Composite Figures

Find the area of the figure.

1.

3 cm

3 cm

5 cm

5 cm   2 cm
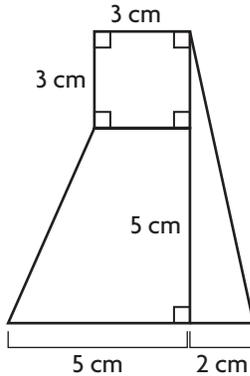
area of square $A = s \times s$

$= $ __**3**__ $\times$ __**3**__ $=$ __**9**__ cm^2

area of triangle $A = \frac{1}{2}bh$

$= \frac{1}{2} \times$ __**2**__ $\times$ __**8**__ $=$ __**8**__ cm^2

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

$= \frac{1}{2} \times ($__**5**__ $+$ __**3**__$) \times$ __**5**__ $=$ __**20**__ cm^2

area of composite figure

$A = $ __**9**__ cm^2 $+$ __**8**__ cm^2 $+$ __**20**__ cm^2

$= $ __**37**__ cm^2

2.

6 ft   10 ft

9 ft

12 ft

_____

3.

7 yd

4 yd

8 yd

11 yd   14 yd

_____
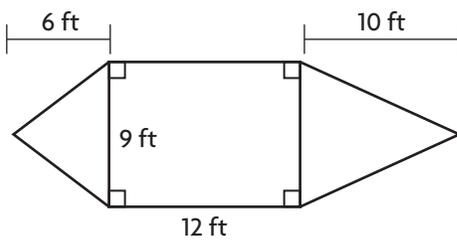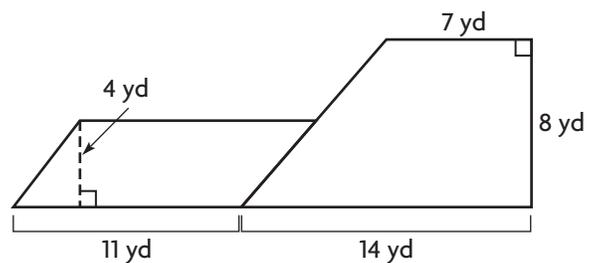
Problem Solving · Real World

4. Janelle is making a poster. She cuts a triangle out of poster board. What is the area of the poster board that she has left?

9 in.

10 in.

20 in.

_____
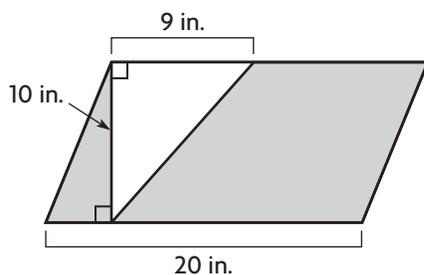
**5.** Michael wants to place grass on the sides of his lap pool. Find the area of the shaded regions that he wants to cover with grass.

25 yd

12 yd

3 yd   12 yd

_____
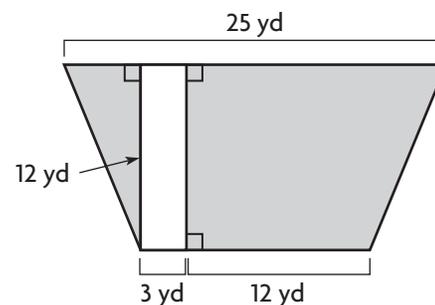
Lesson Check <small>(6.G.1, 6.EE.2c)</small>

1. What is the area of the composite figure?

7 m

7 m

10 m

9 m

34 m

2. What is the area of the shaded region?

13 in.

12 in.

15 in.

11 in.
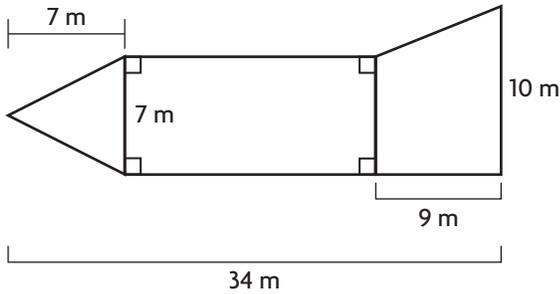
21 in.

_____

_____
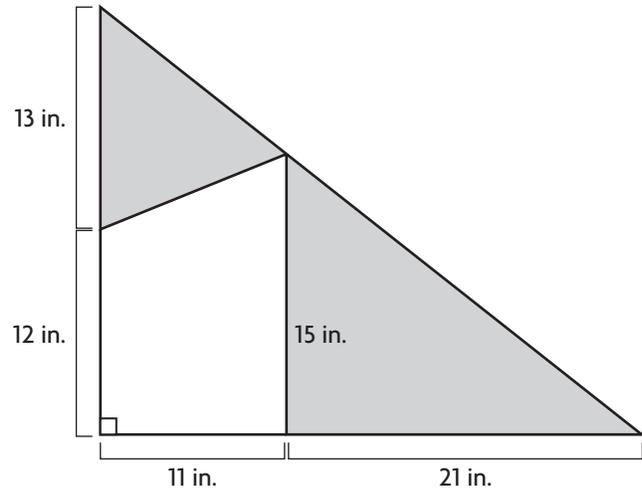
Spiral Review <small>(6.EE.2c, 6.EE.8, 6.EE.9, 6.G.1)</small>

3. In Maritza's family, everyone's height is greater than 60 inches. Write an inequality that represents the height h, in inches, of any member of Maritza's family.

_____

_____

_____

4. The linear equation $y = 2x$ represents the cost y for x pounds of apples. Which ordered pair lies on the graph of the equation?

_____

_____

_____

5. Two congruent triangles fit together to form a parallelogram with a base of 14 inches and a height of 10 inches. What is the area of each triangle?

_____

6. A regular hexagon has sides measuring 7 inches. If the hexagon is divided into 6 congruent triangles, each has a height of about 6 inches. What is the approximate area of the hexagon?

_____

Problem Solving • Changing Dimensions

COMMON CORE STANDARD—6.G.1
Solve real-world and mathematical problems involving area, surface area, and volume.

Read each problem and solve.

1. The dimensions of a 5-in. by 3-in. rectangle are multiplied by 6. How is the area affected?

new dimensions: $l = 6 \times 5 = 30$ in.
$W = 6 \times 3 = 18$ in.

$\dfrac{\text{new area}}{\text{original area}} = \dfrac{540}{15} = 36$

original area: $A = 5 \times 3 = 15$ in.^{2}

new area: $A = 30 \times 18 = 540$ in.^{2}

The area was multiplied by **36**.

2. The dimensions of a 7-cm by 2-cm rectangle are multiplied by 3. How is the area affected?

multiplied by _____

3. The dimensions of a 3-ft by 6-ft rectangle are multiplied by $\frac{1}{3}$. How is the area affected?

multiplied by _____

4. The dimensions of a triangle with base 10 in. and height 4.8 in. are multiplied by 4. How is the area affected?

multiplied by _____

5. The dimensions of a 1-yd by 9-yd rectangle are multiplied by 5. How is the area affected?

multiplied by _____

6. The dimensions of a 4-in. square are multiplied by 3. How is the area affected?

multiplied by _____

7. The dimensions of a triangle with base 1.5 m and height 6 m are multiplied by 2. How is the area affected?

multiplied by _____

8. The dimensions of a triangle are multiplied by $\frac{1}{4}$. The area of the smaller triangle can be found by multiplying the area of the original triangle by what number?

_____

Lesson Check (6.G.1)

1. The dimensions of Rectangle A are 6 times the dimensions of Rectangle B. How do the areas of the rectangles compare?

2. A model of a triangular piece of jewelry has an area that is $\frac{1}{4}$ the area of the jewelry. How do the dimensions of the triangles compare?

Spiral Review (6.RP.3c, 6.EE.2c, 6.EE.8, 6.G.1)

3. Gina made a rectangular quilt that was 5 feet wide and 6 feet long. She used yellow fabric for 30% of the quilt. What was the area of the yellow fabric?

4. Graph $y > 3$ on a number line.
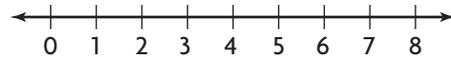
5. The parallelogram below is made from two congruent trapezoids. What is the area of the shaded trapezoid?

6. A rectangle has a length of 24 inches and a width of 36 inches. A square with side length 5 inches is cut from the middle and removed. What is the area of the figure that remains?
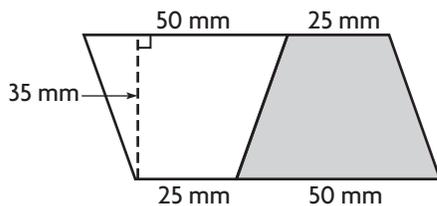
Name _____

Figures on the Coordinate Plane

1. The vertices of triangle *DEF* are $D(^-2, 3)$, $E(3, ^-2)$, and $F(^-2, ^-2)$. Graph the triangle, and find the length of side $\overline{DF}$.

   Vertical distance of *D* from 0: $|3| =$ **3** units

   Vertical distance of *F* from 0: $|^-2| =$ **2** units

   The points are in different quadrants, so add to find the

   distance from *D* to *F*: **3** + **2** = **5** units.
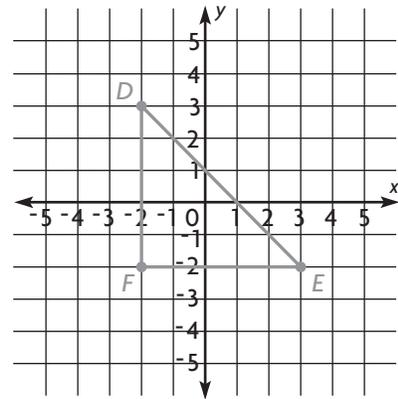
Graph the figure and find the length of side $\overline{BC}$.

2. $A(1, 4)$, $B(1, ^-2)$, $C(^-3, ^-2)$, $D(^-3, 3)$
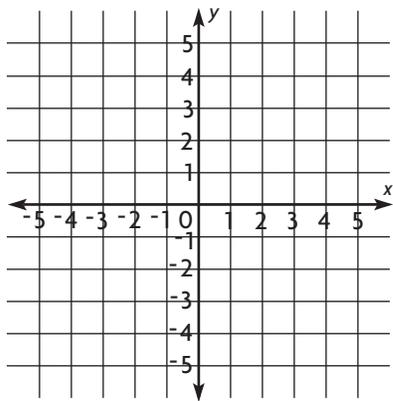
   Length of $\overline{BC} =$ _____ units

3. $A(^-1, 4)$, $B(5, 4)$, $C(5, 1)$, $D(^-1, 1)$
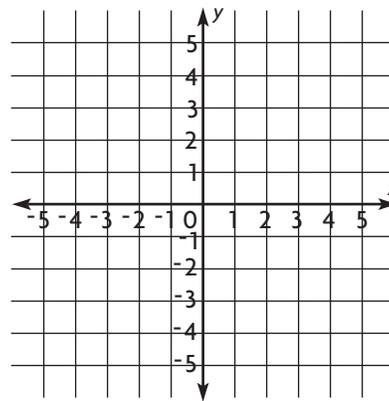
   Length of $\overline{BC} =$ _____ units

Problem Solving Real World

4. On a map, a city block is a square with three of its vertices at $(^-4, 1)$, $(1, 1)$, and $(1, ^-4)$. What are the coordinates of the remaining vertex?

5. A carpenter is making a shelf in the shape of a parallelogram. She begins by drawing parallelogram *RSTU* on a coordinate plane with vertices $R(1, 0)$, $S(^-3, 0)$, and $T(^-2, 3)$. What are the coordinates of vertex *U*?

Lesson Check

1. The coordinates of points *M*, *N*, and *P* are *M*(⁻2, 3), *N*(4, 3), and *P*(5, ⁻1). What coordinates for point *Q* make *MNPQ* a parallelogram?

2. Dirk draws quadrilateral *RSTU* with vertices *R*(⁻1, 2), *S*(4, 2), *T*(5, ⁻1), and *U*(⁻2, ⁻1). Which is the best way to classify the quadrilateral?

Spiral Review

3. Marcus needs to cut a 5-yard length of yarn into equal pieces for his art project. Write an equation that models the length *l* in yards of each piece of yarn if Marcus cuts it into *p* pieces.

4. The area of a triangular flag is 330 square centimeters. If the base of the triangle is 30 centimeters long, what is the height of the triangle?

5. A trapezoid is $6\frac{1}{2}$ feet tall. Its bases are 9.2 feet and 8 feet long. What is the area of the trapezoid?

6. The dimensions of the rectangle below will be multiplied by 3. How will the area be affected?

$4\frac{1}{2}$ m

10 m