

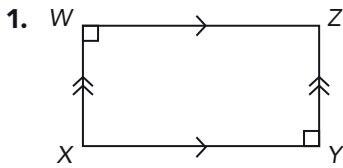
CHAPTER



Area of Polygons

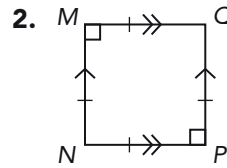
Lesson 10.1 Area of Triangles

Name each figure and identify the pairs of parallel lines.



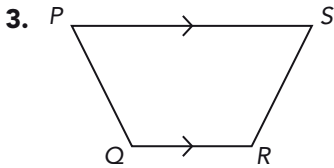
_____ is parallel to _____.

_____ is parallel to _____.

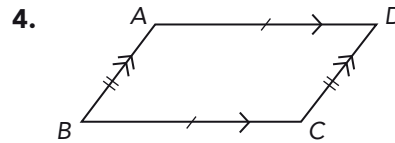


_____ is parallel to _____.

_____ is parallel to _____.

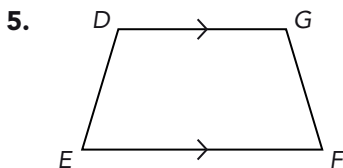


_____ is parallel to _____.

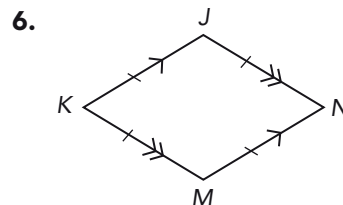


_____ is parallel to _____.

_____ is parallel to _____.



_____ is parallel to _____.



_____ is parallel to _____.

_____ is parallel to _____.

Name: _____

Date: _____

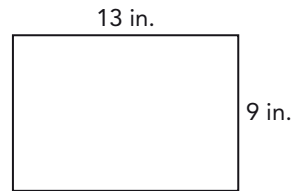
Solve.

7. The length of a rectangle is 13 inches and its width is 9 inches. Find the area of the rectangle.

$$\text{Area} = \ell w$$

$$= \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}} \text{ in.}^2$$



The area of the rectangle is _____ square inches.

8. The length of a rectangle is 20 meters and its width is 14 meters. Find the area of the rectangle.

$$\text{Area} = \ell w$$

$$= \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}} \text{ m}^2$$

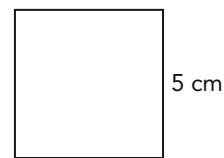
The area of the rectangle is _____ square meters.

9. The side length of a square is 5 centimeters. Find the area of the square.

$$\text{Area} = \ell^2$$

$$= \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}} \text{ cm}^2$$



The area of the square is _____ square centimeters.

10. The side length of a square is 11 feet. Find the area of the square.

$$\text{Area} = \ell^2$$

$$= \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}} \text{ ft}^2$$

The area of the square is _____ square feet.

Find the area of each triangle.

Example

In triangle ABC , \overline{CD} is perpendicular to \overline{AB} . Find the area of triangle ABC .

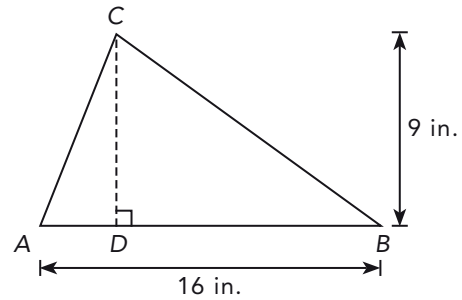
Base = \underline{AB} = $\underline{16}$ in.

Height = \underline{CD} = $\underline{9}$ in.

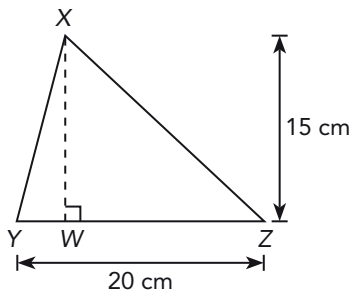
$$\begin{aligned} \text{Area of triangle} &= \frac{1}{2}bh \\ &= \frac{1}{2} \cdot \underline{16} \cdot \underline{9} \\ &= \underline{72} \text{ in.}^2 \end{aligned}$$

The area of triangle ABC is $\underline{72}$ square inches.

The **height** of the triangle is always perpendicular to the base.



11. In triangle XYZ , \overline{XW} is perpendicular to \overline{YZ} . Find the area of triangle XYZ .



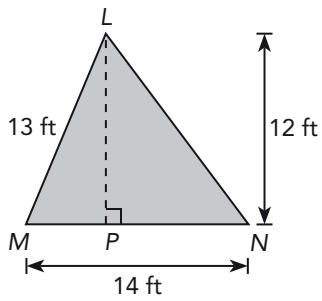
Base = _____ = _____ cm

Height = _____ = _____ cm

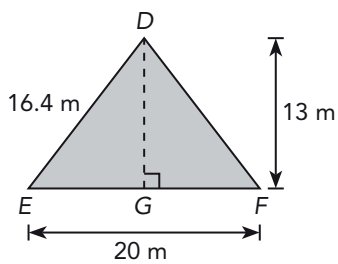
$$\begin{aligned} \text{Area of triangle} &= \frac{1}{2}bh \\ &= \frac{1}{2} \cdot \underline{\hspace{2cm}} \cdot \underline{\hspace{2cm}} \\ &= \underline{\hspace{2cm}} \text{ cm}^2 \end{aligned}$$

The area of triangle XYZ is _____ square centimeters.

12.



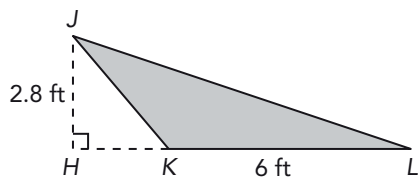
13.



Find the area of each triangle.

Example

In triangle JKL , \overline{JH} is perpendicular to \overline{KL} . Find the area of triangle JKL .



Base = \underline{KL} = $\underline{6}$ ft

Height = \underline{JH} = $\underline{2.8}$ ft

$$\begin{aligned} \text{Area of triangle} &= \frac{1}{2}bh \\ &= \frac{1}{2} \cdot \underline{6} \cdot \underline{2.8} \\ &= \underline{8.4} \text{ ft}^2 \end{aligned}$$

JK is not the height of the triangle, because it is not perpendicular to KL.

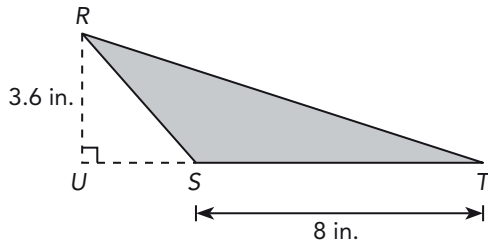


The area of triangle JKL is $\underline{8.4}$ square feet.

Name: _____

Date: _____

14. In triangle RST , \overline{RU} is perpendicular to \overline{ST} . Find the area of triangle RST .



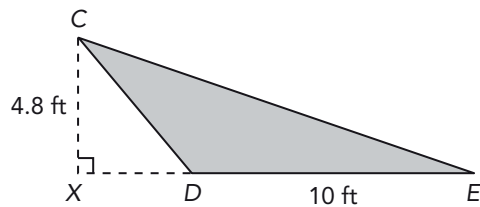
Base = _____ = _____ in.

Height = _____ = _____ in.

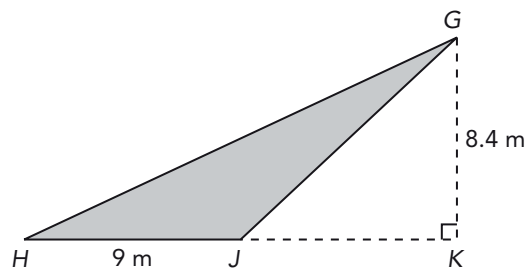
$$\begin{aligned} \text{Area of triangle} &= \frac{1}{2}bh \\ &= \frac{1}{2} \cdot \text{_____} \cdot \text{_____} \\ &= \text{_____ in.}^2 \end{aligned}$$

The area of triangle RST is _____ square inches.

15.

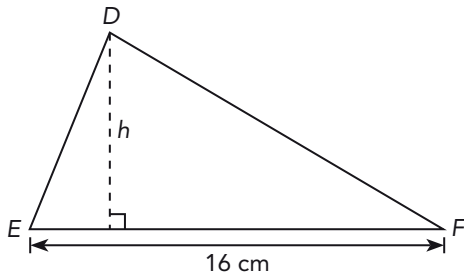


16.



Find the height of each triangle.*Example*

The area of triangle DEF is 60 square centimeters. Find the height of the triangle.



$$\text{Area of triangle } DEF = \frac{1}{2}bh$$

$$\underline{60} = \frac{1}{2} \cdot \underline{16} \cdot h$$

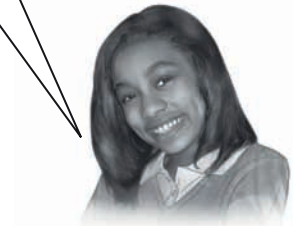
$$\underline{60} = \underline{8} \cdot h$$

$$\underline{60} \div \underline{8} = \underline{8} \cdot h \div \underline{8}$$

$$\underline{7.5} = h$$

The height of triangle DEF is 7.5 centimeters.

Use the formula for the area of a triangle. Substitute known variables, and solve the equation.



17. The area of triangle STU is 108 square inches. Find the height of the triangle.

$$\text{Area of triangle } STU = \frac{1}{2}bh$$

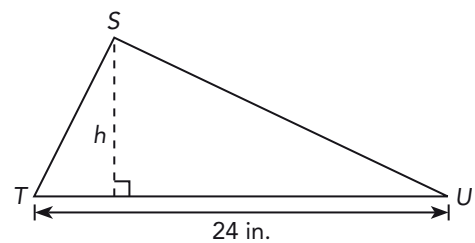
$$\underline{\hspace{2cm}} = \frac{1}{2} \cdot \underline{\hspace{2cm}} \cdot h$$

$$\underline{\hspace{2cm}} = \underline{\hspace{2cm}} \cdot h$$

$$\underline{\hspace{2cm}} \div \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \cdot h \div \underline{\hspace{2cm}}$$

$$\underline{\hspace{2cm}} = h$$

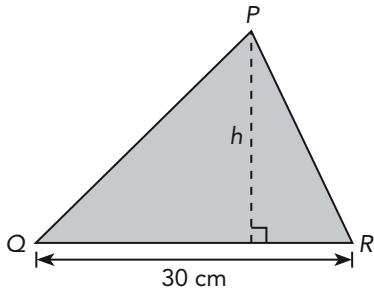
The height of triangle STU is _____ inches.



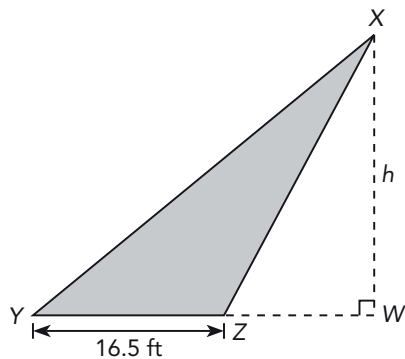
Name: _____

Date: _____

18. The area of triangle PQR is 300 square centimeters.



19. The area of triangle XYZ is 198 square feet.



Find the base of each triangle.

Example

The area of triangle CDE is 135 square centimeters. Find the base of the triangle.

$$\text{Area of triangle } CDE = \frac{1}{2}bh$$

$$\frac{135}{1} = \frac{1}{2} \cdot b \cdot \frac{18}{1}$$

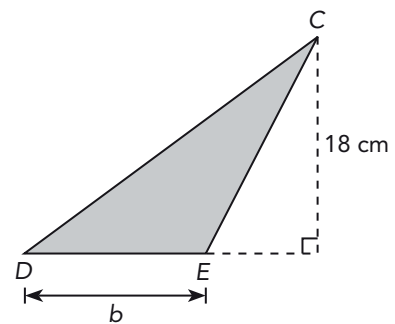
$$\frac{135}{1} = \frac{1}{2} \cdot \frac{18}{1} \cdot b$$

$$\frac{135}{1} = 9 \cdot b$$

$$\frac{135}{9} \div \frac{9}{9} = \frac{9}{9} \cdot b \div \frac{9}{9}$$

$$\frac{15}{1} = b$$

The base of triangle CDE is 15 centimeters.



Rearrange the terms using the commutative property.

Name: _____

Date: _____

20. The area of triangle GHJ is 286 square inches. Find the base of the triangle.

$$\text{Area of triangle } GHJ = \frac{1}{2}bh$$

$$\text{_____} = \frac{1}{2} \cdot b \cdot \text{_____}$$

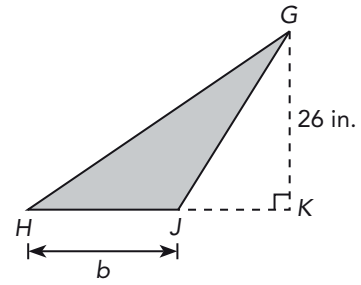
$$\text{_____} = \frac{1}{2} \cdot \text{_____} \cdot b$$

$$\text{_____} = \text{_____} \cdot b$$

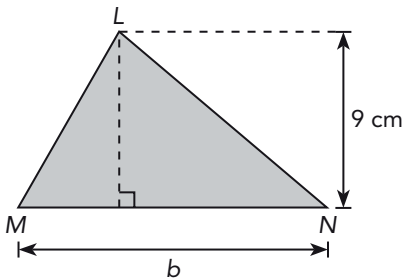
$$\text{_____} \div \text{_____} = \text{_____} \cdot b \div \text{_____}$$

$$\text{_____} = b$$

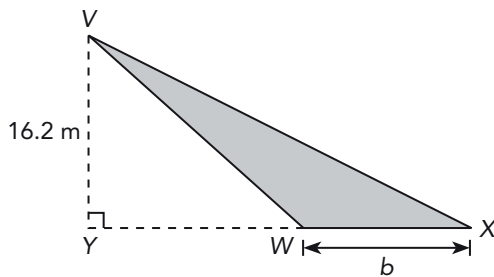
The base of triangle GHJ is _____ inches.



21. The area of triangle LMN is 72 square centimeters.



22. The area of triangle VWX is 113.4 square meters.



20. $10 \text{ ft} = 10 \div 5$

$= 2$ grid squares

For point E to be in the park, the x-coordinate has to be 2 grid squares to the right of \overline{AB} .

$2 + 2 = 4$ grid squares

So, point E is 4 grid squares to the right of the y-axis.

The x-coordinate of point E is $4 \times 5 = 20$.

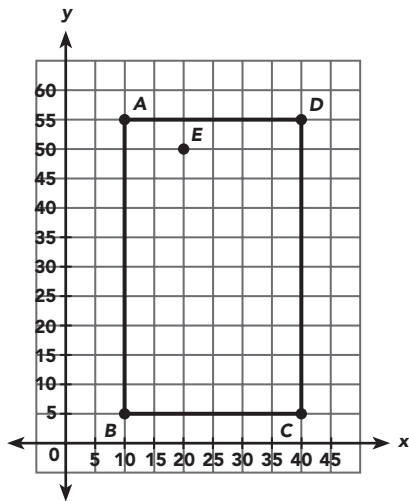
For point E to be in the park, the y-coordinate has to be 1 grid square below \overline{AD} .

$11 - 1 = 10$ grid squares

So, point E is 10 grid squares above the x-axis.

The y-coordinate of point E is $10 \times 5 = 50$.

The coordinates of point E are $(20, 50)$.

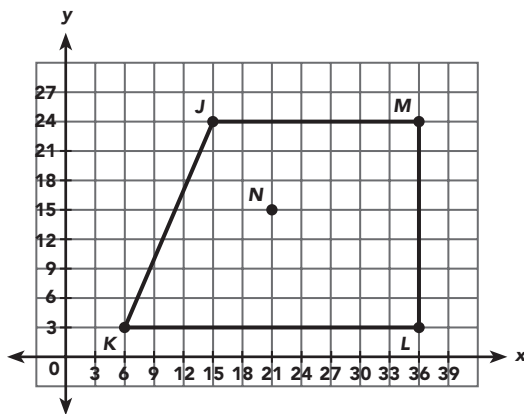


21. $J(15, 24), K(6, 3), L(36, 3), M(36, 24)$

22. Sum of the parallel sides = 51 meters
Height of the trapezoid = 21 meters

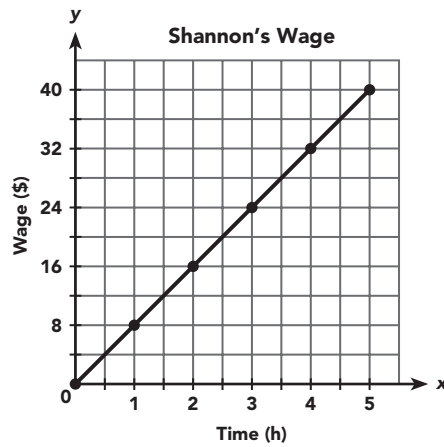
23. Area of the stage = 535.5 square meters

24. 94.8 meters 25. $(21, 15)$



Lesson 9.3

1.



2. It is a straight line graph.

3. From the graph, Shannon's wage is \$28.

4. From the graph, Shannon must work for 5 hours.

5. $w = 8 \cdot (\underline{5} + \underline{3})$
 $= 8 \cdot \underline{8}$
 $= \underline{\$64}$

Shannon earns \$64.

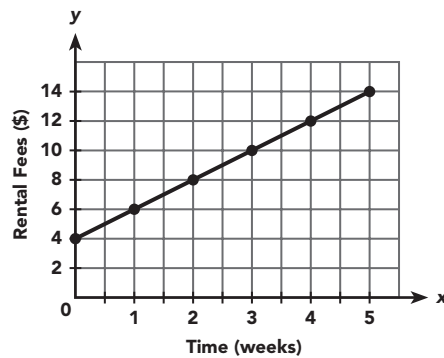
6. $h \geq 2.5$

7. w is the dependent variable and h is the independent variable.

8.

Time (t weeks)	0	1	2	3	4	5
Rental Fees (c dollars)	4	6	<u>8</u>	<u>10</u>	<u>12</u>	<u>14</u>

Rental Fees of a Second-hand Bookstore



9. 4 weeks

10. \$22

11. $t < 3$

Chapter 10

Lesson 10.1

1. rectangle

\overline{WZ} is parallel to \overline{XY} .

\overline{WX} is parallel to \overline{ZY} .

2. square

\overline{MQ} is parallel to \overline{NP} .

\overline{MN} is parallel to \overline{QP} .

3. trapezoid
 \overline{PS} is parallel to \overline{QR} .
4. parallelogram
 \overline{AD} is parallel to \overline{BC} .
 \overline{AB} is parallel to \overline{DC} .
5. trapezoid
 \overline{DG} is parallel to \overline{EF} .
6. rhombus
 \overline{KJ} is parallel to \overline{MN} .
 \overline{JN} is parallel to \overline{KM} .
7. Area = ℓw
 $= 13 \times 9$
 $= 117 \text{ in.}^2$
 The area of the rectangle is 117 square inches.
8. Area = ℓw
 $= 20 \times 14$
 $= 280 \text{ m}^2$
 The area of the rectangle is 280 square meters.
9. Area = ℓ^2
 $= 5 \times 5$
 $= 25 \text{ cm}^2$
 The area of the square is 25 square centimeters.
10. Area = ℓ^2
 $= 11 \times 11$
 $= 121 \text{ ft}^2$
 The area of the square is 121 square feet.
11. Base = $\overline{YZ} = 20 \text{ cm}$
 Height = $\overline{XW} = 15 \text{ cm}$
 Area of triangle = $\frac{1}{2}bh$
 $= \frac{1}{2} \cdot 20 \cdot 15$
 $= 150 \text{ cm}^2$
 The area of triangle XYZ is 150 square centimeters.
12. 84 square feet
13. 130 square meters
14. Base = $\overline{ST} = 8 \text{ in.}$
 Height = $\overline{RU} = 3.6 \text{ in.}$
 Area of triangle = $\frac{1}{2}bh$
 $= \frac{1}{2} \cdot 8 \cdot 3.6$
 $= 14.4 \text{ in.}^2$
 The area of triangle RST is 14.4 square inches.
15. 24 square feet
16. 37.8 square meters
17. Area of triangle $STU = \frac{1}{2}bh$
 $108 = \frac{1}{2} \cdot 24 \cdot h$
 $108 = 12 \cdot h$
 $108 \div 12 = 12 \cdot h \div 12$
 $9 = h$
 The height of triangle STU is 9 inches.

18. 20 centimeters
19. 24 feet
20. Area of triangle $GHJ = \frac{1}{2}bh$
 $286 = \frac{1}{2} \cdot b \cdot 26$
 $286 = \frac{1}{2} \cdot 26 \cdot b$
 $286 = 13 \cdot b$
 $286 \div 13 = 13 \cdot b \div 13$
 $22 = b$
 The base of triangle GHJ is 22 inches.
21. 16 centimeters
22. 14 meters

Lesson 10.2

1. Base = $\overline{GH} = 20 \text{ in.}$
 Height = $\overline{JK} = 12 \text{ in.}$
 Area of parallelogram $FGHJ = bh$
 $= 20 \cdot 12$
 $= 240 \text{ in.}^2$

The area of parallelogram $FGHJ$ is 240 square inches.

2. 48 square meters
3. 28.5 square centimeters
4. Height = $\overline{LM} = 20 \text{ in.}$
 Sum of bases = $\overline{HL} + \overline{JK}$
 $= 15 + 30$
 $= 45 \text{ in.}$

Area of trapezoid $HJKL$

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

$$= \frac{1}{2} \cdot 20 \cdot 45$$

$$= 450 \text{ in.}^2$$

The area of trapezoid $HJKL$ is 450 square inches.

5. 78 square centimeters
6. 162 square feet
7. Height = $\overline{GH} = 5 \text{ in.}$
 Sum of bases = $\overline{DG} + \overline{EF}$
 $= 5 + 9$
 $= 14 \text{ in.}$

Area of trapezoid $DEFG$

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

$$= \frac{1}{2} \cdot 5 \cdot 14$$

$$= 35 \text{ in.}^2$$

The area of trapezoid $DEFG$ is 35 square inches.