Name: _____ Date: _____

## Lesson 9.2 Length of Line Segments

**Use the symbol | | to write the absolute values of the following numbers.**

**1.** 7

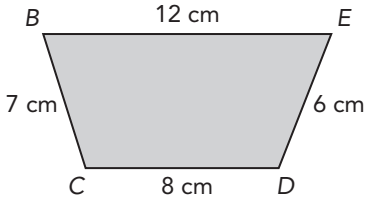
**2.** −5

**3.** −18

**4.** 101

**Find the perimeter of each polygon.**

**5.** Figure *BCDE* is a trapezoid.

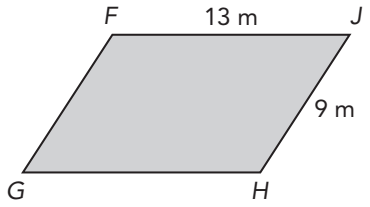



Perimeter

= _____ + _____ + _____ + _____

= _____ cm

**6.** Figure *FGHJ* is a parallelogram.

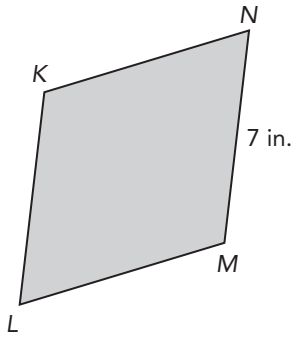



Perimeter

= _____ + _____ + _____ + _____

= _____ m

**7.** Figure *KLMN* is a rhombus.




Perimeter

= _____ + _____ + _____ + _____

= _____ in.

Name: _____ Date: _____

**Plot each pair of points on the coordinate plane below. Connect the points to form a line segment and find its length.**

*Example*

**a)** $A$ (2, 0) and $B$ (6, 0)
By counting the number of units from 2 to 6, the length of $\overline{AB}$ is ___4___ units.

**b)** $C$ (−3, 0) and $D$ (−9, 0)
By counting the number of units from −3 to −9, the length of $\overline{CD}$ is ___6___ units.

**c)** $E$ (0, 3) and $F$ (0, 5)

$EF$ = |$y$-coordinate of ___F___| − |$y$-coordinate of ___E___|

= |___5___| − |___3___| = ___2___ units

The length of $\overline{EF}$ is ___2___ units.

To find the length of $\overline{EF}$, subtract $EO$ from $FO$.

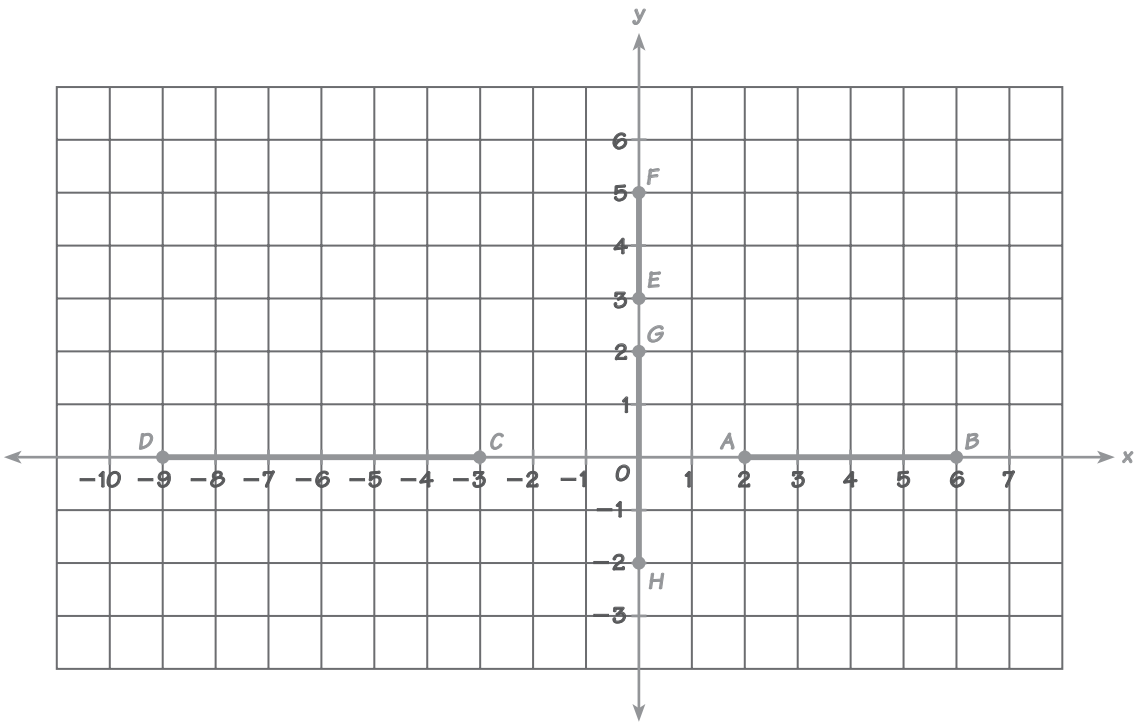
**d)** $G$ (0, 2) and $H$ (0, −2)

$GH$ = |$y$-coordinate of ___G___| + |$y$-coordinate of ___H___|

= |___2___| + |___−2___| = ___4___ units

The length of $\overline{GH}$ is ___4___ units.

To find the length of $\overline{GH}$, add $GO$ and $OH$.



Name: _____ Date: _____

**8.** $M$ (5, 0) and $N$ (8, 0)

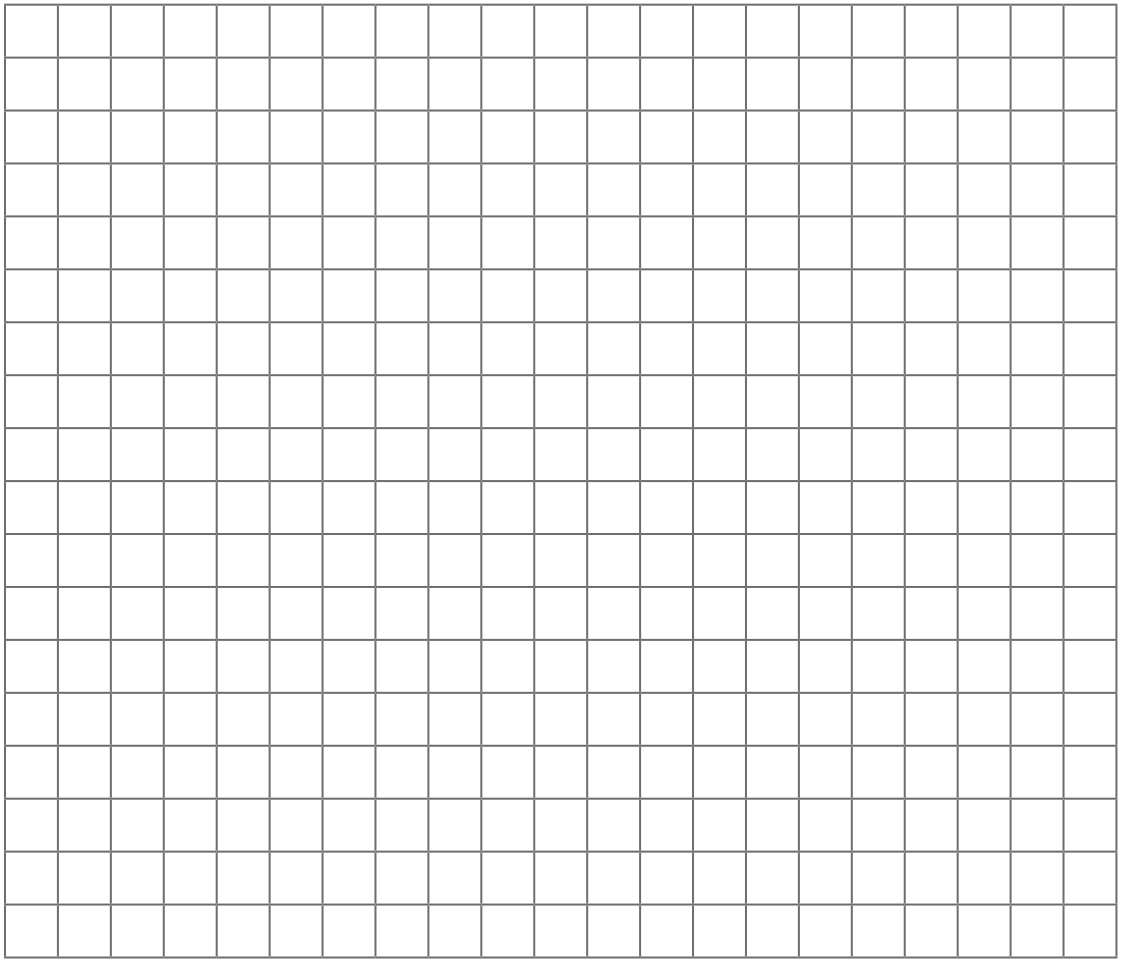
By counting the number of units from 5 to 8, the length of $\overline{MN}$

is _____ units.

**9.** $P$ (−2, 0) and $Q$ (−7, 0)

By counting the number of units from −2 to −7, the length of $\overline{PQ}$

is _____ units.



Name: _____ Date: _____

**10.** $R$ (0, 5) and $S$ (0, 9)

$RS$ = |$y$-coordinate of _____| − |$y$-coordinate of _____|

= |_____| − |_____|

= _____ units

The length of $\overline{RS}$ is _____ units.

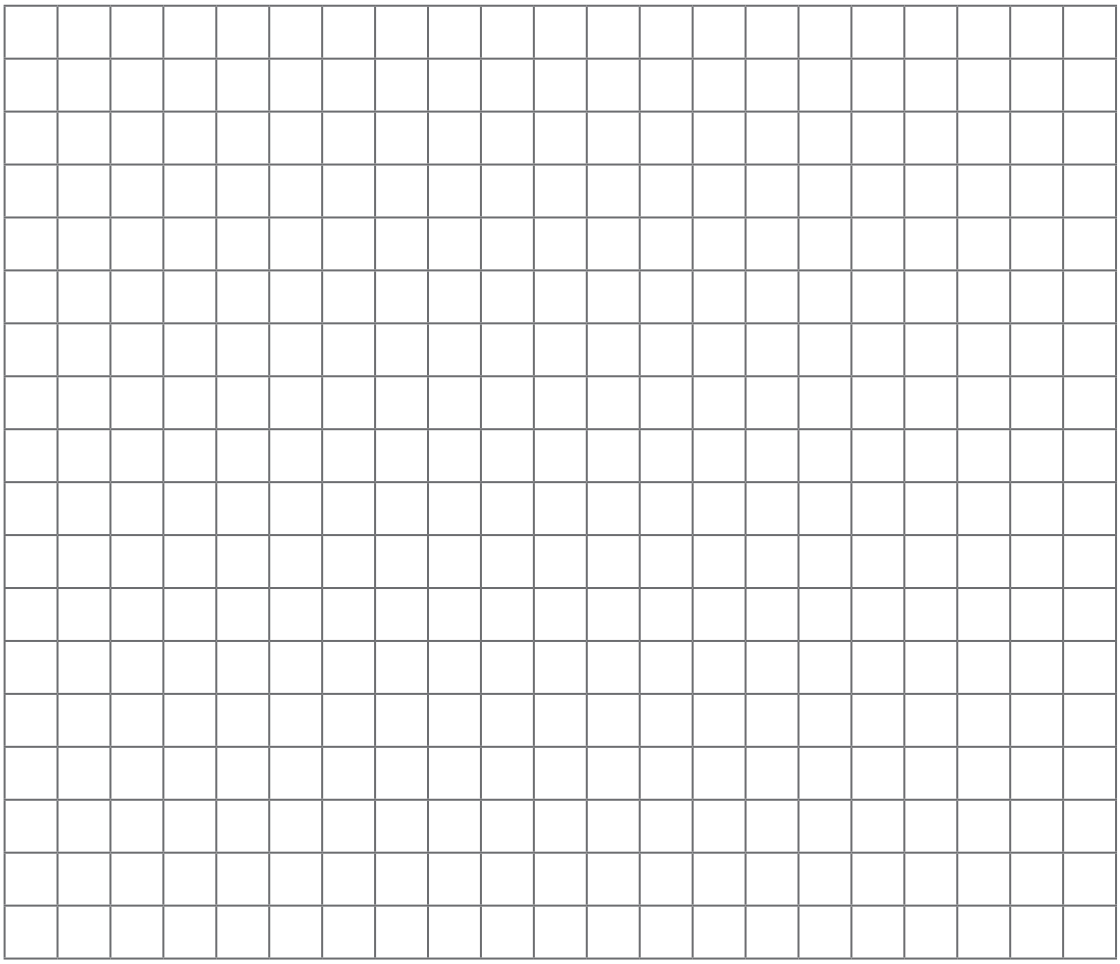
**11.** $T$ (0, 3) and $U$ (0, −6)

$TU$ = |$y$-coordinate of _____| + |$y$-coordinate of _____|

= |_____| + |_____|

= _____ units

The length of $\overline{TU}$ is _____ units.



Name: _____ Date: _____

**Plot each pair of points on the coordinate plane below. Connect the points to form a line segment and find its length.**

*Example*

**a)** $A$ (1, 3) and $B$ (4, 3)

$AB$ = |$x$-coordinate of B| − |$x$-coordinate of A|

= |4| − |1|

= 3 units

The length of $\overline{AB}$ is 3 units.

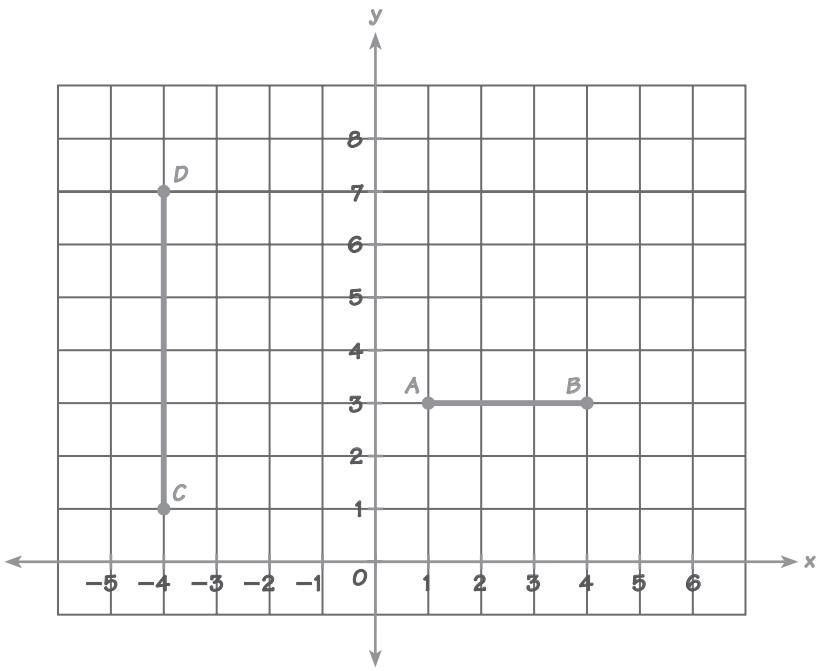

**b)** $C$ (−4, 1) and $D$ (−4, 7)

$CD$ = |$y$-coordinate of D| − |$y$-coordinate of C|

= |7| − |1|

= 6 units

The length of $\overline{CD}$ is 6 units.



Name: _____ Date: _____

**c)** $E$ (5, 4) and $F$ (5, −4)

$EF$ = |$y$-coordinate of E| + |$y$-coordinate of F|

= |4| + |−4|

= 8 units

The length of $\overline{EF}$ is 8 units.

**d)** $G$ (−3, −2) and $H$ (4, −2)

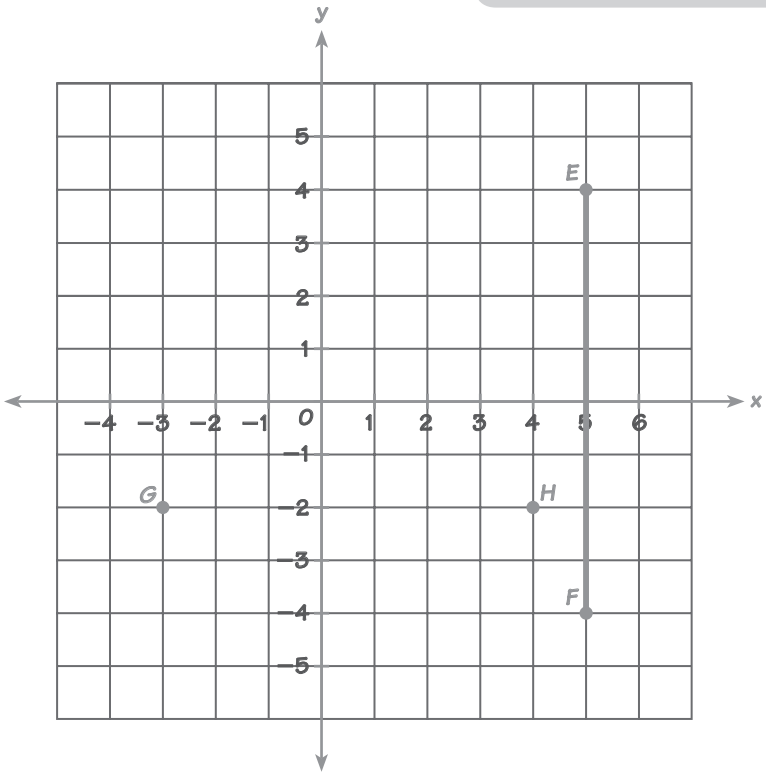
$GH$ = |$x$-coordinate of G| + |$x$-coordinate of H|

= |−3| + |4|

= 7 units

The length of $\overline{GH}$ is 7 units.

To find the length of $\overline{GH}$, add the distance of point $G$ from the $y$-axis to the distance of point $H$ from the $y$-axis.



Name: _____ Date: _____

**12.** $J$ (−6, 2) and $K$ (−1, 2)

$JK$ = |$x$-coordinate of _____| − |$x$-coordinate of _____|

= |_____| − |_____|

= _____ units

The length of $\overline{JK}$ is _____ units.

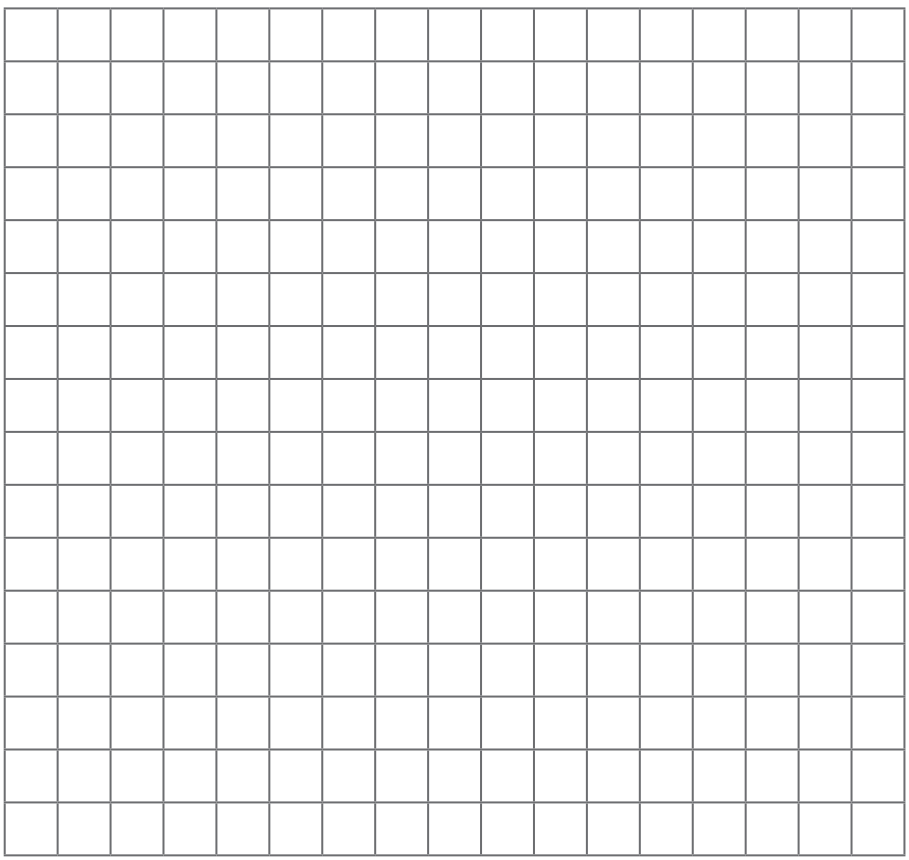
**13.** $L$ (4, 2) and $M$ (4, 8)

$LM$ = |$y$-coordinate of _____| − |$y$-coordinate of _____|

= |_____| − |_____|

= _____ units

The length of $\overline{LM}$ is _____ units.



Name: _____ Date: _____

**14.** $N$ (1, 6) and $P$ (1, −3)

$NP$ = |$y$-coordinate of _____| + |$y$-coordinate of _____|

= |_____| + |_____|

= _____ units

The length of $\overline{NP}$ is _____ units.

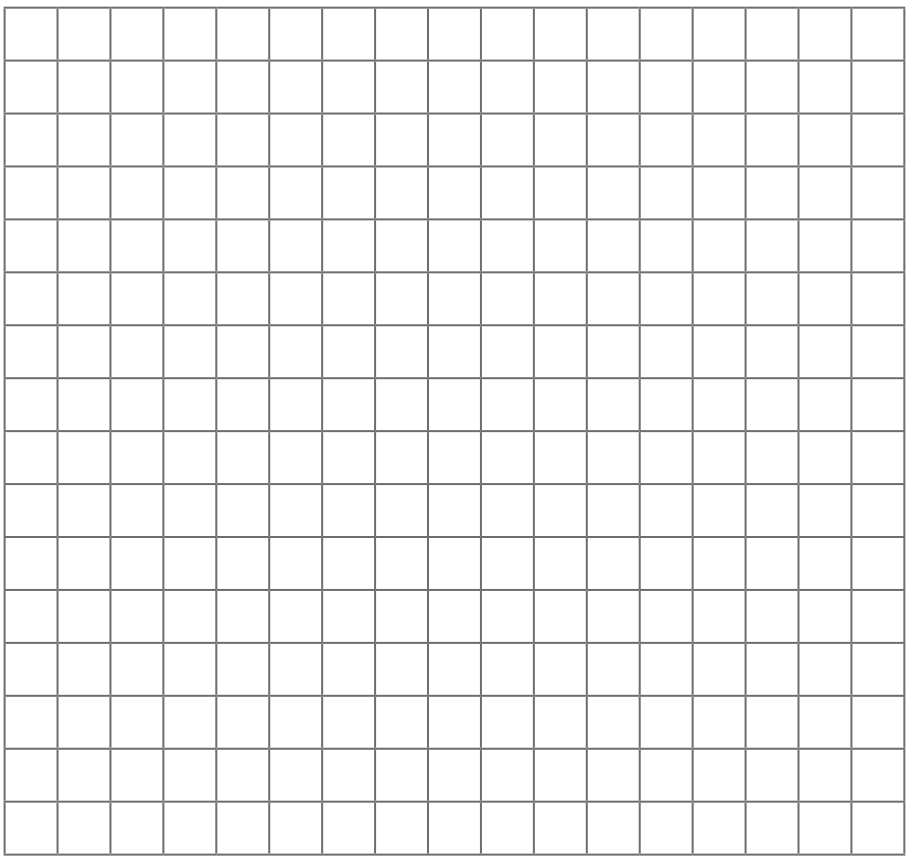
**15.** $Q$ (−6, −4) and $R$ (5, −4)

$QR$ = |$x$-coordinate of _____| + |$x$-coordinate of _____|

= |_____| + |_____|

= _____ units

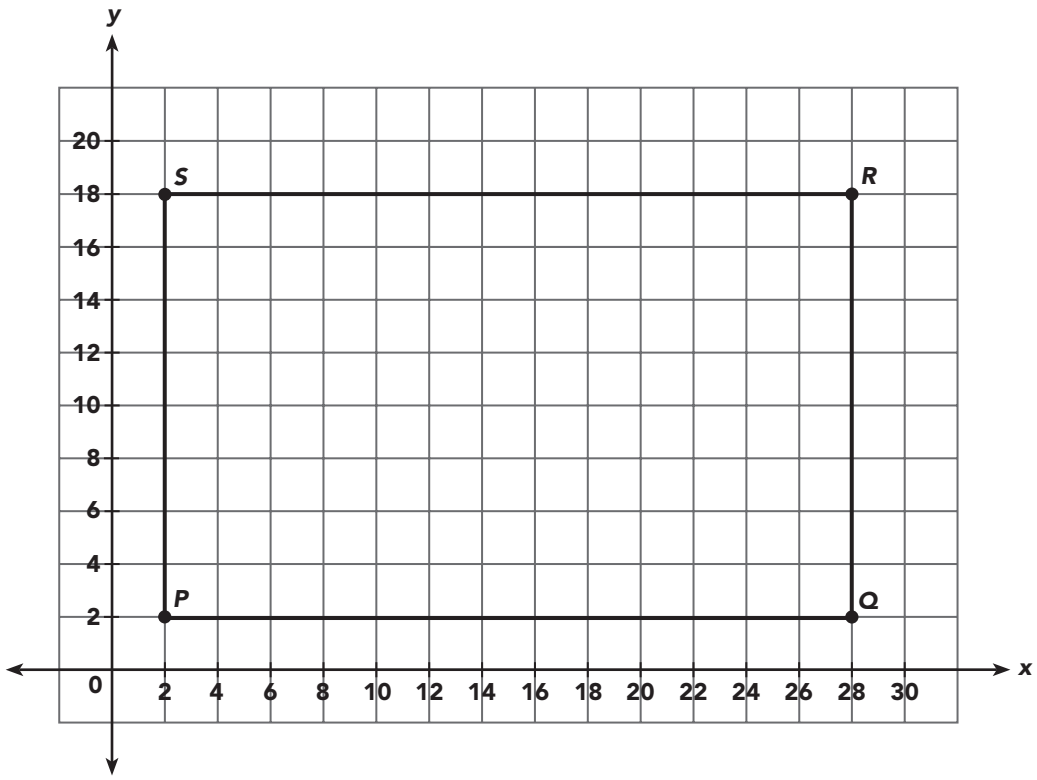
The length of $\overline{QR}$ is _____ units.



Name: _____ Date: _____

**In the diagram, rectangle *PQRS* represents a rectangular living room. The side length of each grid square is 2 feet. Use the diagram to answer questions a) to e).**

*Example*




**a)** Give the coordinates of points *P*, *Q*, *R*, and *S*.

The coordinates are P (2, 2), Q (28, 2), R (28, 18), and S (2, 18).

**b)** Find the length and width of the living room in feet.

Length = PQ

= 28 – 2

= 26 ft

The length of the living room is 26 feet.

Width = PS

= 18 – 2

= 16 ft

The width of the living room is 16 feet.

Name: _____ Date: _____

**c)** Find the area of the living room in square feet.

Area = $\ell w$

= 26 · 16

= 416 $ft^2$

The area of the living room is 416 square feet.

**d)** Find the perimeter of the living room in feet.

Perimeter = $2 \cdot (\ell + w)$

= 2 · (26 + 16)

= 2 · 42

= 84 ft

The perimeter of the living room is 84 feet.

**e)** There is a standing lamp at point *W* in the living room at a distance of 22 feet from $\overline{PS}$ and 2 feet from $\overline{PQ}$. Give the coordinates of point *W* and plot it on the coordinate plane.

1 grid square represents 2 feet.

22 ft = 22 ÷ 2

= 11 grid squares

For point *W* to be in the living room, the *x*-coordinate has to be

11 grid squares to the right of $\overline{PS}$.

1 + 11 = 12 grid squares

So, point *W* is 12 grid squares to the right of the *y*-axis.

The *x*-coordinate of point *W* is 12 × 2 = 24.

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For point $W$ to be in the living room, the $y$-coordinate has to be

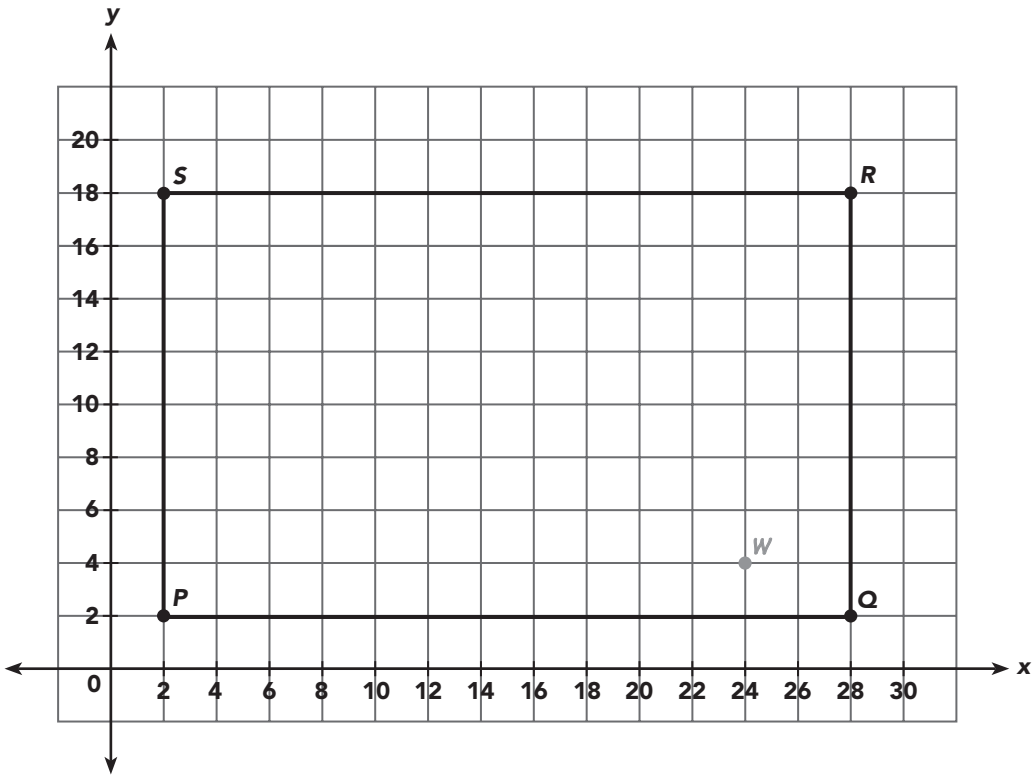
1 grid square above $\overline{PQ}$.

1 + 1 = 2 grid squares

So, point $W$ is 2 grid squares above the $x$-axis.

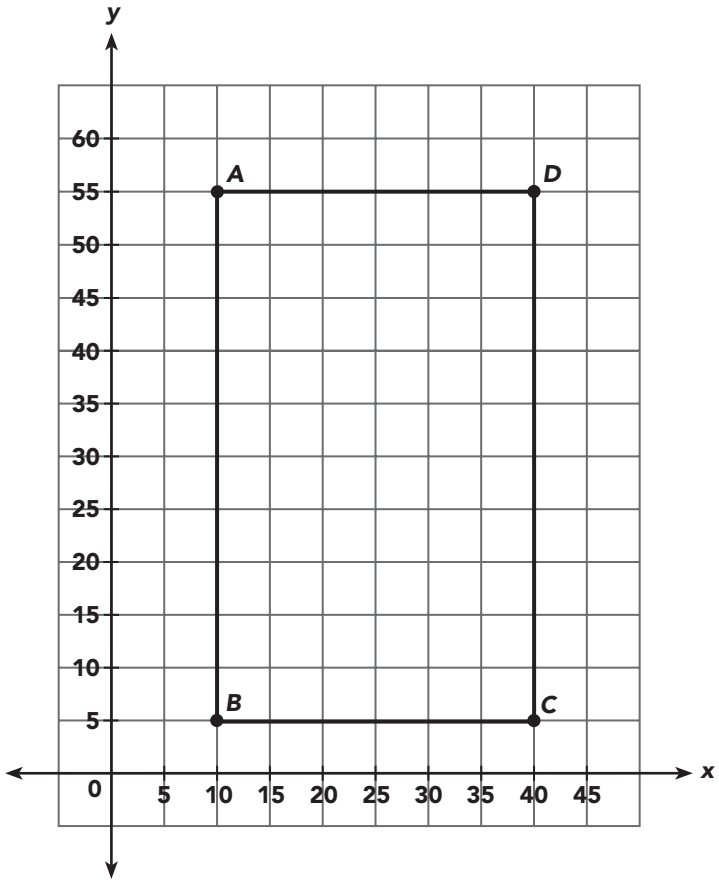
The $y$-coordinate of point $W$ is 2 × 2 = 4.

The coordinates of point $W$ are (24, 4).



Name: _____ Date: _____

**In the diagram, rectangle *ABCD* represents a park. The side length of each grid square is 5 feet. Use the diagram to answer questions 16 to 20.**




**16.** Give the coordinates of points *A*, *B*, *C*, and *D*.

**17.** Find the length and width of the park in feet.

Length = _____

= _____ − _____

= _____ ft

The length of the park is _____ feet.

Width = _____

= _____ − _____

= _____ ft

The width of the park is _____ feet.

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**18.** Find the area of the park in square feet.

Area = $\ell w$

= _____ · _____

= _____ $ft^2$

The area of the park is _____ square feet.

**19.** Find the perimeter of the park in feet.

Perimeter = $2 \cdot (\ell + w)$

= 2 · (_____ + _____)

= 2 · _____

= _____ ft

The perimeter of the park is _____ feet.

**20.** There is a tree planted at point *E* in the park at a distance of 10 feet from $\overline{AB}$ and 5 feet from $\overline{AD}$. Give the coordinates of point *E* and plot it on the coordinate plane.

1 grid square represents 5 feet.

10 ft = _____ ÷ _____

= _____ grid squares

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

_____ + _____ = _____ grid squares

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

The *x*-coordinate of point *E* is _____ × _____ = _____.

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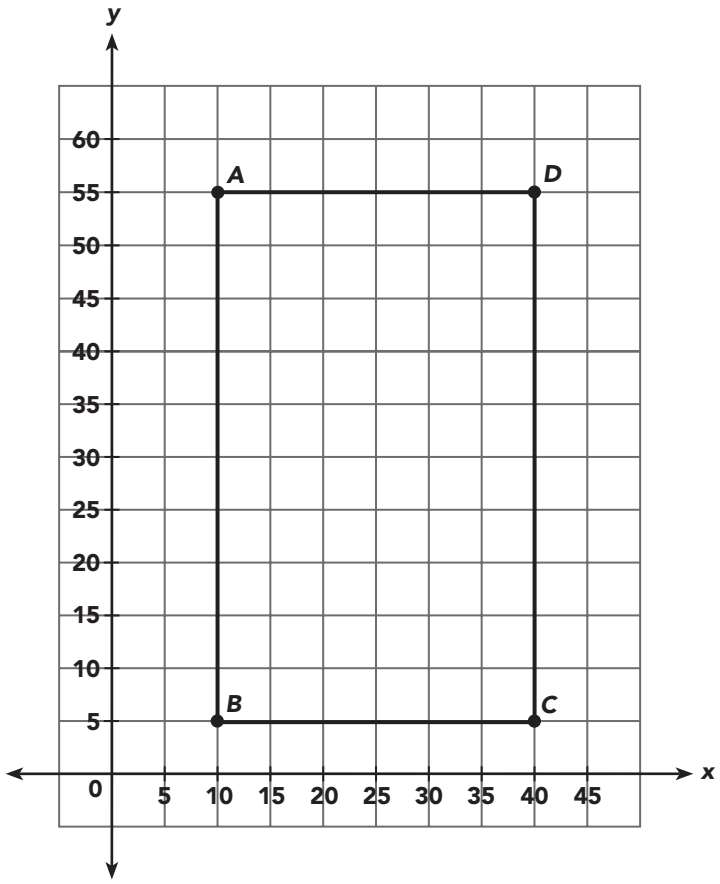
For point *E* to be in the park, the *y*-coordinate has to be _____ grid square below $\overline{AD}$.

_____ − _____ = _____ grid squares

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

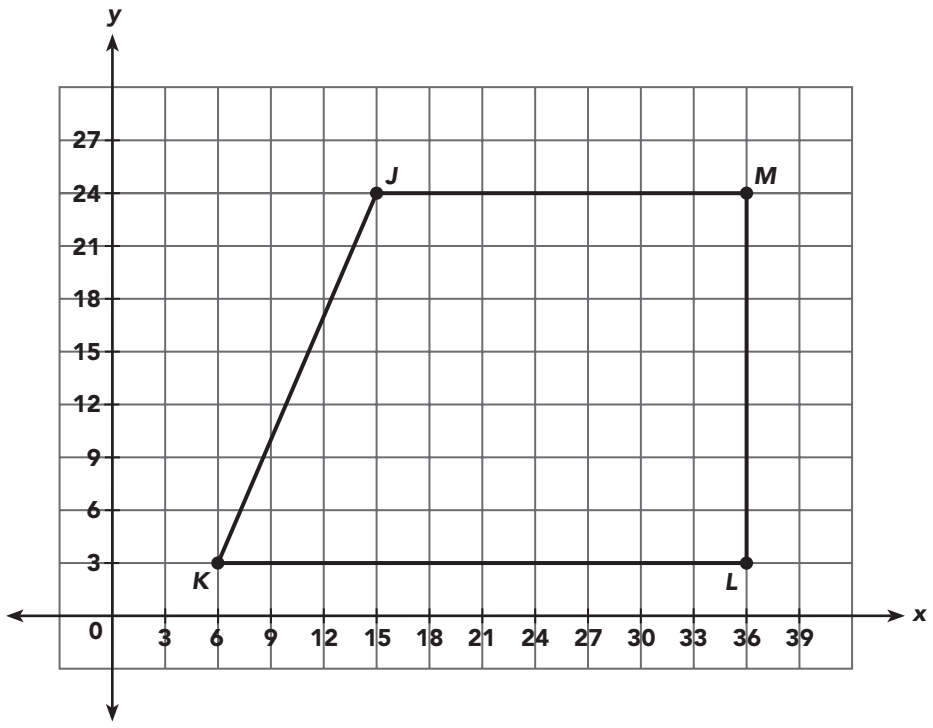
The *y*-coordinate of point *E* is _____ × _____ = _____.

The coordinates of point *E* are (_____, _____).



Name: _____ Date: _____

**In the diagram, trapezoid *JKLM* represents a stage. The side length of each grid square is 3 meters. Use the diagram to answer questions 21 to 25.**




**21.** Give the coordinates of points *J*, *K*, *L*, and *M*.

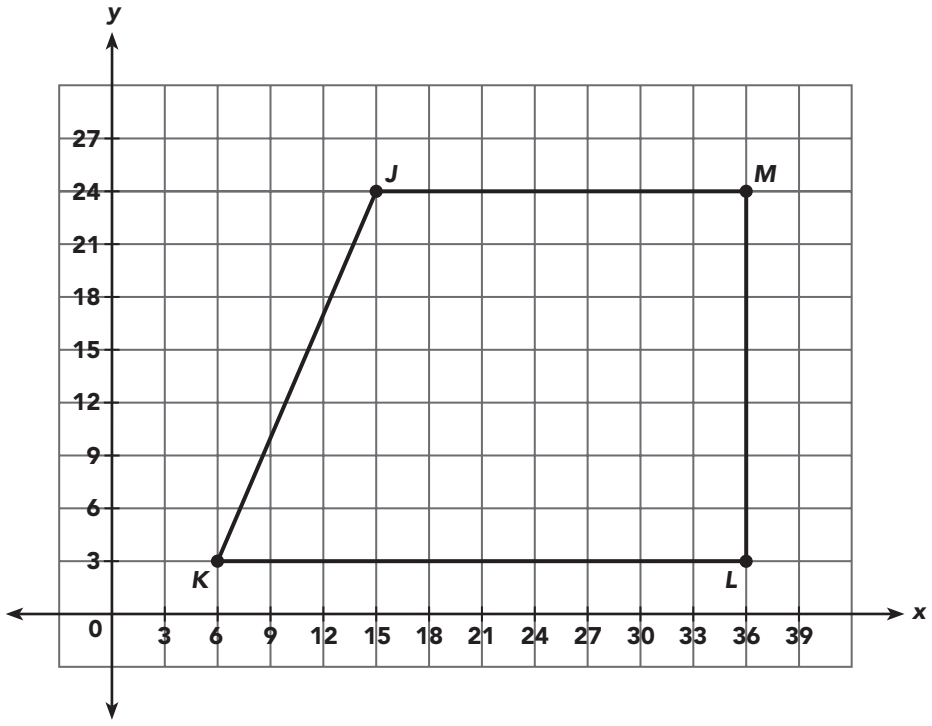
**22.** Find the sum of the parallel sides, and the height of trapezoid *JKLM* in meters.

**23.** Find the area of the stage in square meters.

Name: _____ Date: _____

**24.** Jason measured the length of $\overline{JK}$ and found it to be is 22.8 meters. Find the perimeter of the stage in meters.

**25.** A cross is marked at point *N* on the stage for an upcoming production. Point *N* is at a distance of 9 meters from $\overline{JM}$ and 15 meters from $\overline{ML}$. Give the coordinates of point *N* and plot it on the coordinate plane.

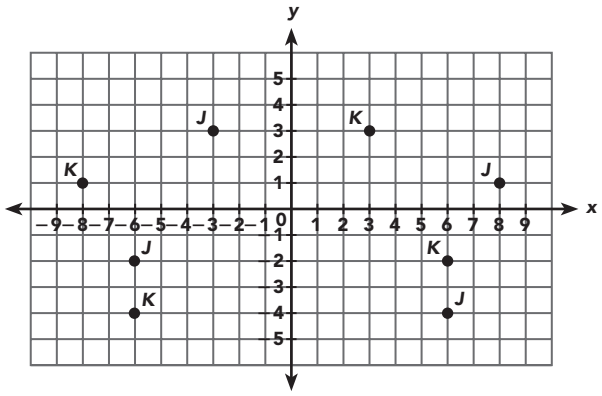


**11.** (−8, 1)

**12.** (−6, −4)

**13.** (3, 3)

**14.** (6, −2)



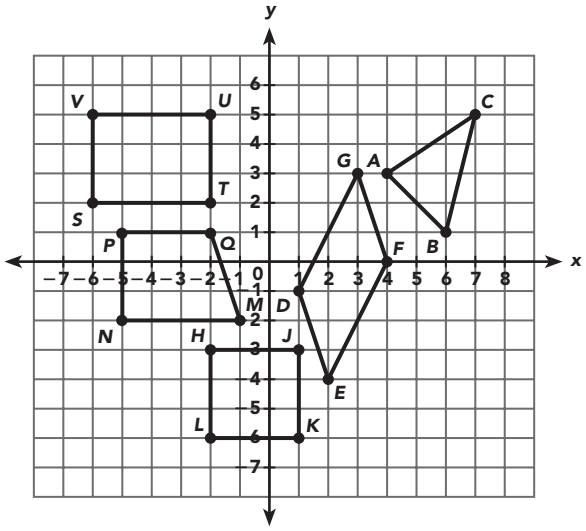

**15.** triangle

**16.** parallelogram

**17.** square

**18.** trapezoid

**19.** rectangle



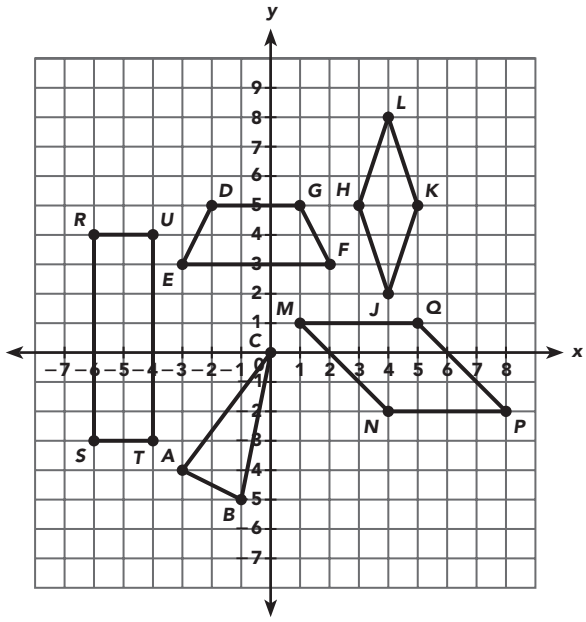

**20.** rectangle

**21.** parallelogram

**22.** rhombus or parallelogram

**23.** trapezoid

**24.** triangle




## Lesson 9.2

**1.** |7| = 7

**2.** |−5| = 5

**3.** |−18| = 18

**4.** |101| = 101

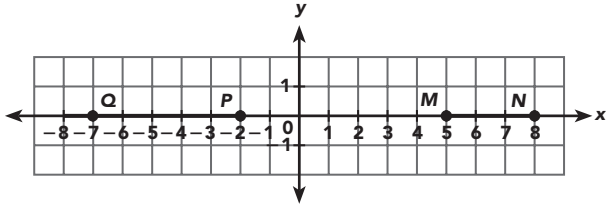
**5.** Perimeter
= 7 + 12 + 6 + 8
= 33 cm

**6.** Perimeter
= 13 + 9 + 13 + 9
= 44 cm

**7.** Perimeter
= 7 + 7 + 7 + 7
= 28 in.

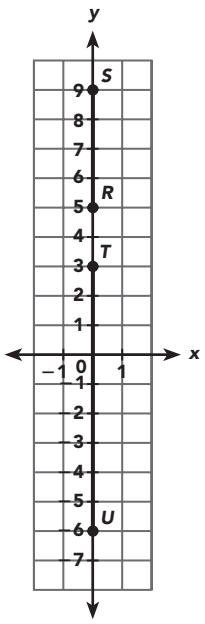
**8.** 3

**9.** 5



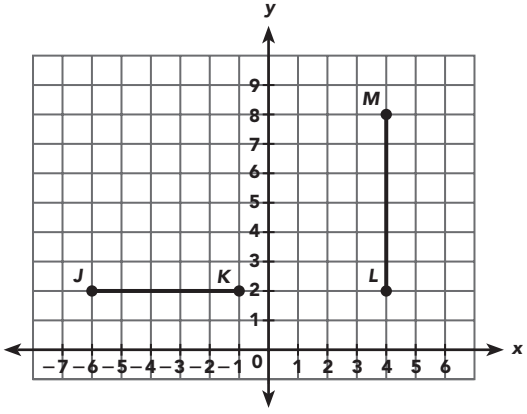
**10.** $RS$ = |y-coordinate of $S$| − |y-coordinate of $R$|
= |9| − |5|
= 4 units
The length of $\overline{RS}$ is 4 units.

**11.** $TU$ = |y-coordinate of $T$| + |y-coordinate of $U$|
= |3| + |−6|
= 9 units
The length of $\overline{TU}$ is 9 units.



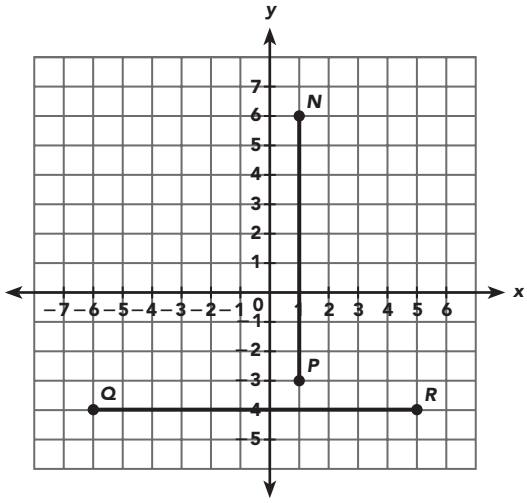

**12.** $JK$ = |x-coordinate of $J$| − |x-coordinate of $K$|
= |−6| − |−1|
= 5 units
The length of $\overline{JK}$ is 5 units.

**13.** $LM$ = |y-coordinate of $M$| − |y-coordinate of $L$|
= |8| − |2|
= 6 units
The length of $\overline{LM}$ is 6 units.




**14.** $NP$ = |y-coordinate of $N$| + |y-coordinate of $P$|
= |6| + |−3|
= 9 units
The length of $\overline{NP}$ is 9 units.

**15.** $QR$ = |x-coordinate of $Q$| + |x-coordinate of $R$|
= |−6| + |5|
= 11 units
The length of $\overline{QR}$ is 11 units.



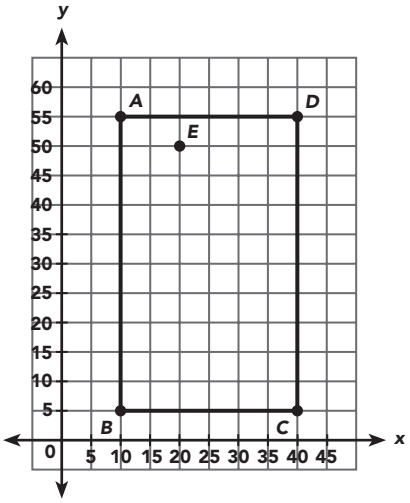

**16.** $A$ (10, 55), $B$ (10, 5), $C$ (40, 5), $D$ (40, 55)

**17.** Length = $AB$
= 55 − 5
= 50 ft
The length of the park is 50 feet.
Width = $BC$
= 40 − 10
= 30 ft
The width of the park is 30 feet.

**18.** Area = $\ell w$
= 50 · 30
= 1,500 ft$^2$
The area of the park is 1,500 square feet.

**19.** Perimeter = 2 · ($\ell$ + $w$)
= 2 · (50 + 30)
= 2 · 80
= 160 ft
The perimeter of the park is 160 feet.

**20.** 10 ft = 10 ÷ 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 × 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 × 5 = 50.
The coordinates of point *E* are (20, 50).

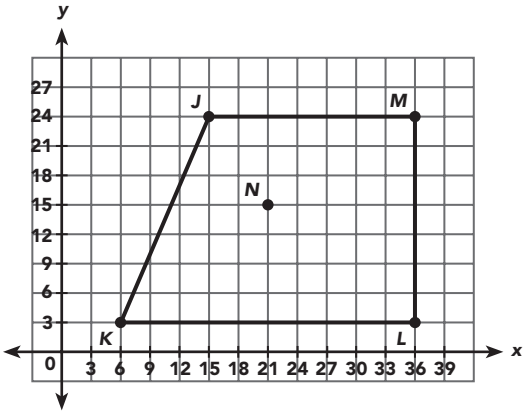



**21.** *J* (15, 24), *K* (6, 3), *L* (36, 3), *M* (36, 24)

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

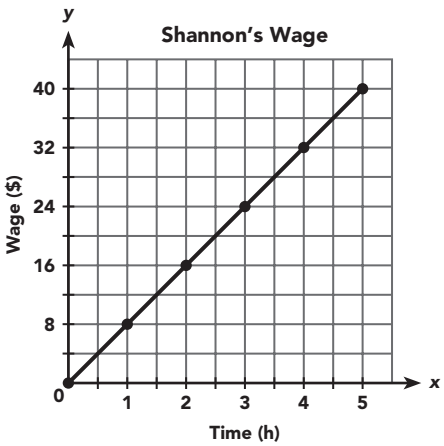
**23.** Area of the stage = 535.5 square meters

**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.

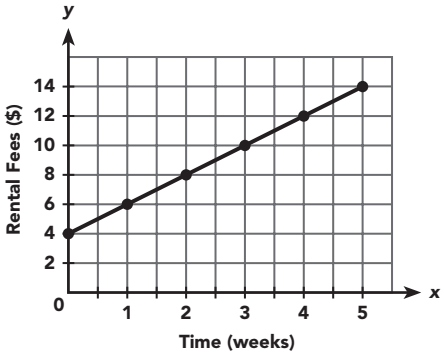
**5.** $w = 8 \cdot (5 + 3)$
$= 8 \cdot 8$
$= \$64$
Shannon earns $64.

**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 | 8 | 10 | 12 | 14 |




**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 $\overline{QP}$.