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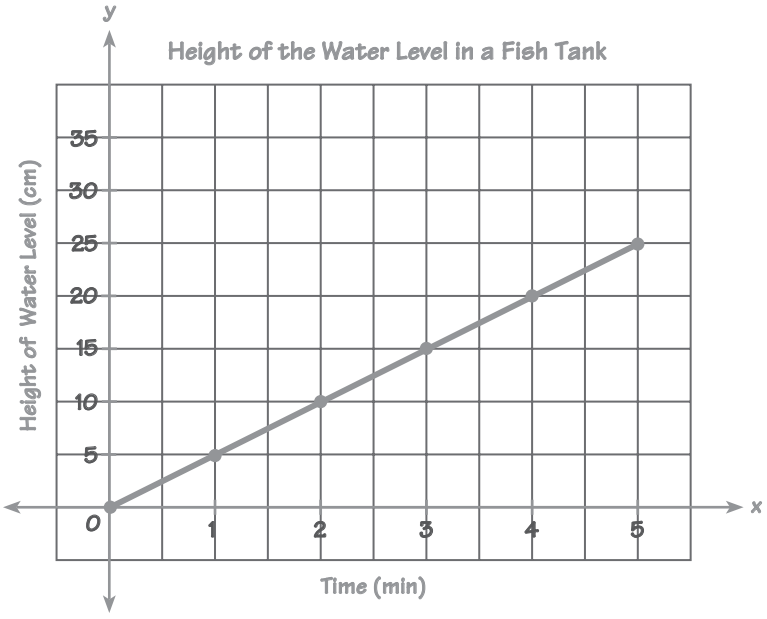
Lesson 9.3 Real-World Problems: Graphing

Use the coordinate plane below. Solve.

Example

Michael is filling a fish tank with water. The water level, h centimeters, after t minutes, is given by $h = 5t$. Graph the relationship between h and t. Use 2 units on the horizontal axis to represent 1 minute and 1 unit on the vertical axis to represent 5 centimeters.

Time (t minutes)	0	1	2	3	4	5
Height of Water Level (h centimeters)	0	5	10	15	20	25



a) What type of graph is it?

It is a straight line graph, also known as a linear graph.

b) What is the height of the water level at 1 minute?

From the graph, the height of the water level is 5 centimeters.

c) If Michael wants the height of the water level to be 10 centimeters, how long will it take him to fill the tank to this level?

From the graph, it will take Michael 2 minutes.

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d) Michael has filled the tank for 5 minutes. He continues to fill the tank for another 2 minutes. What is the height of the water level?

$h = 5t$

$h = 5 \cdot (\underline{5} + \underline{2})$

$h = 5 \cdot \underline{7} = \underline{35}$ cm

The height of the water level is $\underline{35}$ centimeters.

e) Michael wants the height of the water level to be at least 20 centimeters. How long does he take to fill the tank? Express your answer in the form of an inequality in terms of t, where t stands for the number of minutes.

$t \geq 4$

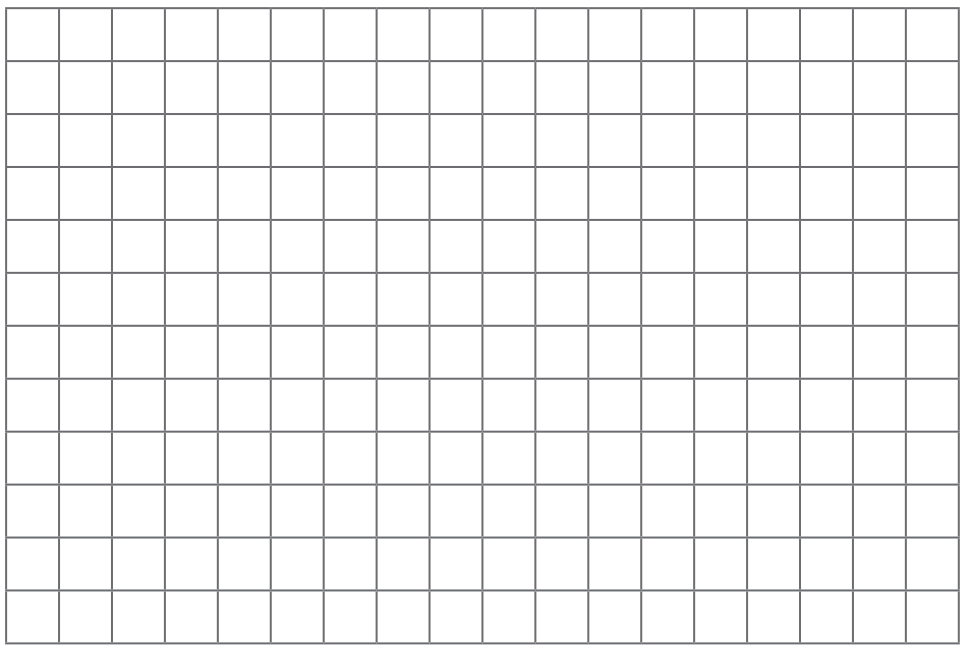
f) Name the dependent and independent variables.

$\underline{h}$ is the dependent variable and $\underline{t}$ is the independent variable.

Shannon's wage, w dollars, for working h hours, is given by $w = 8h$. Graph the relationship between w and h. Use 2 units on the horizontal axis to represent 1 hour and 2 units on the vertical axis to represent $8.

1.

Time (*h* hours)	0	1	2	3	4	5
Wage (*w* dollars)	0	8	16	24	32	40



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2. What type of graph is it?

It is a _____ graph.

3. What is Shannon's wage if she works for 3.5 hours?

From the graph, Shannon's wage is $_____.

4. How long must Shannon work for in order to earn $40?

From the graph, Shannon must work for _____ hours.

5. Shannon has worked for 5 hours. She continues to work for another 3 hours. How much does Shannon earn?

$w = 8h$

$w = 8 \cdot (\_\_\_\_\_ + \_\_\_\_\_)$

$w = 8 \cdot \_\_\_\_\_$

= $_____

Shannon earns $_____.

6. If Shannon wants to earn at least $20, how many hours does she need to work for? Express your answer in the form of an inequality in terms of h, where h stands for the number of hours.

7. Name the dependent and independent variables.

_____ is the dependent variable and _____ is the independent variable.

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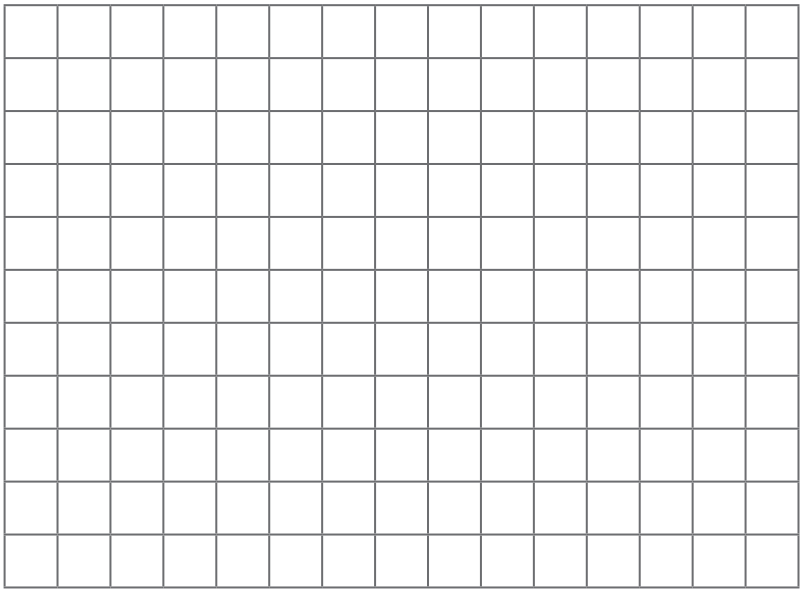
Complete the table. Use the coordinate plane below. Solve.

Michelle wants to rent a book from a second-hand bookstore. The rental fee, c dollars, after t weeks, is given by $c = 2t + 4$. Graph the relationship between c and t. Use 2 units on the horizontal axis to represent 1 week and 1 unit on the vertical axis to represent $2.

8.

Time (t weeks)	0	1	2	3	4	5
Rental Fees (c dollars)	4	6				

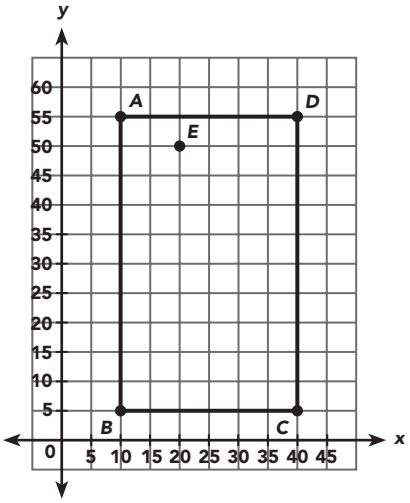


9. The rental fee for a book Michelle borrowed is $12. How many weeks did she keep the book?

10. Michelle has borrowed the book for 5 weeks. She keeps the book for another 4 weeks. What is the rental fee of her book?

11. If Michelle paid less than $10, how many weeks did she keep the book? Express your answer in the form of an inequality in terms of t, where t stands for the number of weeks.

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).

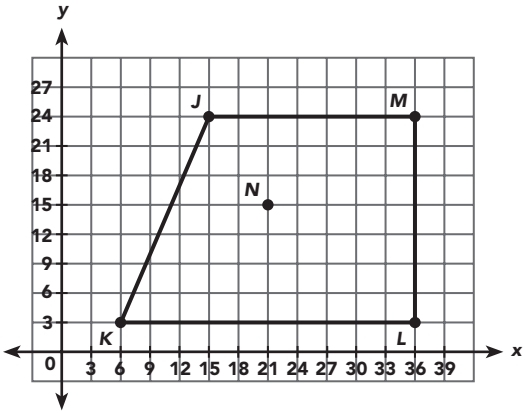


21. *J* (15, 24), *K* (6, 3), *L* (36, 3), *M* (36, 24)

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

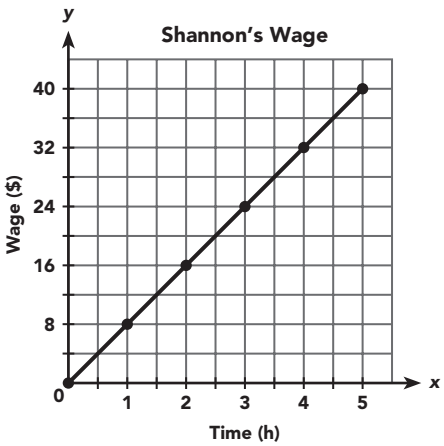
23. Area of the stage = 535.5 square meters

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.

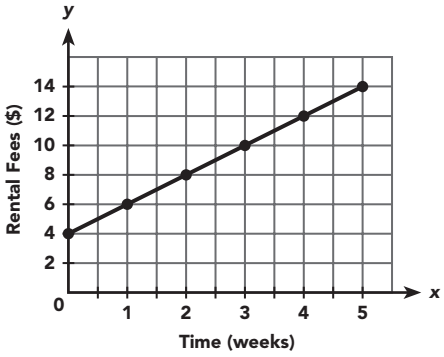
5. $w = 8 \cdot (5 + 3)$
$= 8 \cdot 8$
$= \$64$
Shannon earns $64.

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 $\overline{QP}$.