AchieveMath

Student Book

Volume 2

Name:

Catapult Learning™

Unit 3:

Solve Equations and Represent Proportional Relationships

Catapult Learning™

Printed in the United States of America.

Penny Drive

Read the problems and answer the questions.

1. Kayla's class collected 600 pennies for the charity penny drive. Together, Kayla's class and Wynn's class collected 1,100 pennies.

   a. Draw a tape diagram to represent the situation. Use the variable n to represent the unknown.

   | |
   | |

   b. Write an addition equation to represent the tape diagram. _____

   c. Solve the equation using inverse operations.

   $n =$ _____

   Wynn's class collected _____ pennies.

2. Dawa's class collected 5 times as many pennies as Will's class. Dawa's class collected 800 pennies.

   a. Draw a tape diagram to represent the situation. Use a the variable n to represent the unknown.

   | |
   | |

   b. Write a multiplication equation to represent the tape diagram. _____

   c. Solve the equation using inverse operations.

   $n =$ _____

   Will's class collected _____ pennies.

What's the Inverse?

Review the example problem. Then use inverse operations to solve for the variable in each given equation.

Example

What is the solution to the equation $3f = 36$?

Step 1

Determine what is being done to the variable.

The variable f is being multiplied by 3.

$3f = 36$

Step 2

Determine the inverse operation needed to isolate the variable on one side of the equation.

Division is the inverse of multiplication. Isolating the variable requires dividing both sides by 3.

$$\frac{3f}{3} = \frac{36}{3}$$

Step 3

Solve for the variable by performing the inverse operation.

$$\frac{3f}{3} = \frac{36}{3}$$

$$f = \frac{36}{3}$$

The solution is $f = 12$.

1. $20n = 120$ $n =$ _____

2. $g + 870 = 1{,}180$ $g =$ _____

3. $450 - x = 130$ $x =$ _____

4. $\dfrac{54}{b} = 6$ $b =$ _____

5. $\dfrac{y}{11} = 11$ $y =$ _____

6. $21q = 63$ $q =$ _____

Lesson 21 Exit Ticket

Part 1: Read the problem and answer the questions.

In the penny drive for charity, Tyrell's class collected 1,300 pennies. This is twice as many pennies as Daria's class collected. How many pennies did Daria's class collect?

1. Draw a tape diagram to represent this situation. Consider whether this is a part-part-whole or a scaling situation. Use the variable *n* to represent the unknown.

2. Write a multiplication equation to represent the situation. _____

3. Solve the equation using inverse operations.

   $n =$ _____

   Daria's class collected _____ pennies.

Part 2: Use inverse operations to solve for the variable in each equation.

4. $12n = 3,600$

5. $x - 98 = 56$

   $n =$ _____

   $x =$ _____

Extra Practice: Book Orders

Part 1: Determine whether the following statements are *true* or *false*.

1. The inverse operation of multiplication is addition. _____

2. To keep an equation balanced, whatever you do to one side of the equation, you must do to the other side. _____

3. You can check your equation solution using substitution and fact families. _____

4. The only way to visualize an equation with a variable is to use a tape diagram. _____

5. You can use inverse operations to get a variable by itself and find its value. _____

Part 2: Use tape diagrams and inverse operations to solve equations for a variable and answer questions.

6. Desiree is looking at ordering the new book, *Space Explorers*. The hardback copy is 4 times the cost of the e-book copy. The hardback copy costs $28.

   a. Draw a tape diagram to represent this situation.

   b. Write and solve an equation with a variable to find the cost of the e-book copy.

   The e-book copy of *Space Explorers* is $_____.

Part 3: Circle the equations that correctly use inverse operations to isolate the variable. Underline equations where balance is not maintained and solve for the variable correctly.

$$7 + k - 7 = 22 - 7$$

$$a \div 8 = 10 \times 8$$

$$d + 18 - 18 = 3 - 18$$

$$6c + 6 = 54 + 6$$

$$g - 24 + 24 = 50$$

$$t \div 25 \times 25 = 9 \times 25$$

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Tape Diagrams

Tape Diagrams

Code Breaker

Code Key			
A	1	**N**	14
B	2	**O**	15
C	3	**P**	16
D	4	**Q**	17
E	5	**R**	18
F	6	**S**	19
G	7	**T**	20
H	8	**U**	21
I	9	**V**	22
J	10	**W**	23
K	11	**X**	24
L	12	**Y**	25
M	13	**Z**	26

$2m = 18$	$a + 9 = 23$	$6 + j = 28$	$z(5) = 25$	$\dfrac{b}{3} = 6$	$p - 10 = 9$	$4k = 20$

Duffel Bag Donation

Part 1: Read the problem and answer the questions.

1. Charmaine is in charge of organizing the service club members to work on the duffel bag project. So far, 39 members have signed up for a work time slot. Charmaine says this is ¾ of the club's total membership. Mr. Abel wants to know the total club membership.

   a. What are the known and unknown values in this situation?

   Known values: _____

   Unknown values: _____

   b. Draw a tape diagram model to represent this situation

   c. What equation describes the tape diagram? _____

   d. There are _____ sections in the tape diagram, and _____ sections are shaded.

   e. What is the value of one part of the tape diagram? _____

   f. What is the value of the whole tape diagram? $m =$ _____

   g. There are _____ total members in the service club.

Part 2: Draw a tape diagram to model each scenario for the total membership.

2. ⁵⁄₁₂ of the members working on Saturday are students. 15 students work on Saturday.	3. ⁷⁄₈ of the club's new members signed up for the project. 14 new members signed up.

Bag Budget

Review the example problem. Then solve each problem for the variable.

Example

Kyle was in contact with the charity that will be receiving the duffel bags. He learned that $\frac{2}{3}$ of the pre-K children are girls. There are **12** girls. How many pre-K children are there in all?

Step 1	**Step 2**	**Step 3**
Use known and unknown values to translate the words from the sentence into an equation that includes a variable. $\frac{2}{3}$ *of* an unknown number of pre-K children *is* **12**. Equation: $\frac{2}{3}p = 12$	Identify the reciprocal of the fraction. Multiply both sides of the equation by this reciprocal to isolate the variable. The fraction is $\frac{2}{3}$. The reciprocal is $\frac{3}{2}$. $(\frac{3}{2} \times \frac{2}{3})p = 12 \times \frac{3}{2}$	Solve the equation for the variable and answer the question. $(\frac{3}{2} \times \frac{2}{3})p = 12 \times \frac{3}{2}$ $p = 12 \times \frac{3}{2}$ $p = \frac{36}{2} = 18$ There are 18 pre-K children.

1. Kyle reported that $\frac{2}{5}$ of the total amount budgeted to spend on each duffel bag was spent on the paint to decorate the bag. The paint cost for each bag was $10.

    a. Write an equation for this situation. _____

    b. How much money was budgeted to be spent on each duffel bag? Use the equation from **part a** and multiply by a reciprocal to solve. Show your work.

        $a =$ _____   The amount budgeted for each bag was $_____.

2. $\frac{4}{7}f = 12$ **3.** $r \times \frac{4}{9} = 12$ **4.** $\frac{3}{8}s = 12$

      $f =$ _____ $r =$ _____ $s =$ _____

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Lesson 22 Exit Ticket

Part 1: ⅘ of the Washington Middle School girls' basketball team are eighth graders. There are 28 eighth graders on the team. Answer the questions about this situation.

1. Draw a tape diagram to represent this situation.

2. Write an equation with a fraction and variable for the total number of girls on the team. Solve for the variable.

b = _____

There are _____ total girls on the team.

Part 2: Use multiplication by a reciprocal to solve for the variable in each problem.

3. $\frac{3}{7}y = 21$ **4.** $\frac{6}{15}n = 8$

y = _____   *n* = _____

Extra Practice: Bed Blanket

Part 1: Match each equation with the correct solution.

$\frac{3}{8}c = 42$ $c = 57$

$\frac{5}{6}c = 15$ $c = 112$

$\frac{7}{10}c = 42$ $c = 36$

$\frac{1}{4}c = 9$ $c = 60$

$\frac{2}{3}c = 38$ $c = 18$

Part 2: Stacia's new curtains are 45 inches long. They only cover ⅗ of her window length! She can return them for the right length. What length should they be? Answer the questions to find out.

1. Use the rectangle beside the window to draw a tape diagram that models this situation.

    There are _____ sections in the tape diagram, and _____ sections are shaded.

2. Write and solve an equation to find the correct length for the curtain.
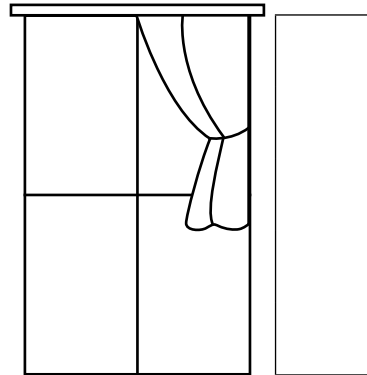
        $c =$ _____

    Stacia's curtains should be _____ inches long.

Tales of the Tapes

Draw a tape diagram to model each scenario.

1. $\frac{5}{6}$ of the students in class like pizza. 25 students in class like pizza. Let s = students in class.

2. 12 books by my favorite author are about sports. $\frac{3}{4}$ of all her books are about sports. Let b = all the books by this author.

3. $\frac{3}{13}$ of the cards in a deck are face cards. There are 12 face cards in a deck. Let c = all the cards in a deck.

4. $\frac{4}{5}$ of doctors who were asked like the BrushyBrushy Toothbrush. 4 of the doctors like this toothbrush. Let d = the number of doctors asked.

5. $\frac{2}{3}$ of the puppies in a litter are female. 8 of the puppies in the litter are female. Let p = the number of puppies in the litter.

Garden Building

Read the problem and answer the questions.

1. The community garden will have different sections for different types of vegetables. The perimeter of the tomato section is 20 feet and the length is 4 times the width.

   a. What is the relationship between the length and width of the tomato section of the garden?

   _____

   b. Draw a part-part-whole tape diagram to represent the perimeter using one variable.

   c. Write an equation to represent the problem, using the perimeter formula ($P = 2l + 2w$) and the tape diagram. Combine like terms to write the equation in simplest terms. Show your work.

   Equation: _____

   d. Solve for the variable using inverse operations. Show your work.

   $w =$ _____

   e. The width of the tomato section is _____ feet and the length is _____ feet.

2. Explain how you can check to see if your answer is correct. _____

   _____

   _____

Combining Terms

Review the example problem. Then solve each equation for the variable by combining like terms and using inverse operations.

Example

Solve for *b*.
9b – 6b = 32 – b

Step 1

Simplify the expression by combining like terms.

9b – 6b = 32 – b
3b = **32 – b**

Step 2

Isolate the variable on one side of the equation using inverse operations.

3b (+ b) = **32 – b (+ b)**
4b = **32**

Step 3

Use inverse operations to solve for the variable.

$$\frac{4b}{4} = \frac{32}{4}$$

b = 8

---

1. $4c = 18 + c$

$c =$ _____

2. $n + (n + 1) = 37$

$n =$ _____

3. $-27 = -3 - 4a$

$a =$ _____

4. $9 = e \div 12$

$e =$ _____

5. $3d + 4d - d = 4d + 12$

$d =$ _____

6. $8f - 28 = -6f$

$f =$ _____

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Lesson 23 Exit Ticket

Part 1: Read the problem and answer the questions.

Hector has volunteered to be in charge of the garden's corn. The perimeter of the corn section is 36 feet and the length is 8 times the width.

1. Draw a tape diagram to represent the perimeter using one variable.

2. Write an equation to represent the problem using the perimeter formula ($P = 2l + 2w$). Combine like terms to write the equation in simplest terms. Show your work.

   Equation: _____

3. Solve for the variable using inverse operations. Show your work.

   _____ = w

   The width of the corn section is _____ feet, and the length is _____ feet.

Part 2: Solve for the variable in each problem. Combine like terms and simplify equations using inverse operations.

4. $3d - d - 1 = 25$ **5.** $42 + 4n = 10n$

$d =$ _____ $n =$ _____

Extra Practice: Don't Lose Your Marbles!

Part 1: Aisha has 46 marbles. Write a term to represent each type of marble. Then complete the table. Use the variable *s* for the number of swirl marbles in all expressions you write.

Blue Marbles	Red Marbles
Aisha has **5 times** as many **blue** marbles as **swirl** marbles. Use the variable s to represent the swirl marbles. Write an expression to show how many blue marbles she has. _____	She has **6 more red** marbles than **blue** marbles. Use the expression you wrote for the blue marbles to write an expression to show how many red marbles she has. _____
Rainbow Marbles	**Glitter Marbles**
Aisha has **3 times** as many rainbow marbles as **swirl** marbles. Write an expression to show how many rainbow marbles she has. _____	She has **twice as many glitter** marbles as **rainbow** marbles. Write an expression to show how many glitter marbles she has. _____

Write an equation and solve for *s*, or the number of swirl marbles Aisha has.

Type of Marble	Expression	How many?
Swirl	*s*	
Blue		
Red		
Rainbow		
Glitter		

s = _____

Part 2: Solve for the variable in each problem. Show your work.

1. $x \div 9 = 11$

2. $26 + 43 - 6 + 7y = 16y$

x = _____

_____ = *y*

Nature Park

Read each problem. Then follow the steps to solve.

1. The city will plant donated trees in a nature park. The original plan for the park was a rectangular area 6 miles wide and 10 miles long. The city now plans to expand the length. The area of the expanded park plan is now 78 square miles. By how much was the length of the park expanded?

   a. Write an expression or number to represent each of the following:

   Width: _____   Area: _____   Original Length: _____   New Length: _____

   b. Write an equation that represents the area of the expanded park. Use the formula $A = l \times w$.

   Equation: _____

   c. Use the distributive property to solve for the variable.

   _____ = e

   d. The length was expanded by _____ miles. The length is now _____ miles.

2. Natasha is studying the health of the lake at the center of the park. She bought 8 kits to test the lake's nitrate levels. With each kit she bought, she also bought a pH test for $3. Natasha spent $96 total on the kits and the pH tests. How much was each kit?

   a. Write an equation based on the tape diagram. Then solve for the variable.

   $k =$ _____   Each kit was _____ dollars.

Distributing Variables

Review the example problem. Then use the distributive property and inverse operations to solve.

Example

What is the solution of the equation $2(q - 7) = 6$?

Step 1	Step 2
Use the distributive property to distribute the factor to the terms in parentheses.	To solve the equation, use inverse operations.
	Add 14 to both sides and then divide both sides by 2:
$2(q - 7) = 6$ $(2 \times q) - (2 \times 7) = 6$ $2q - 14 = 6$	$2q - 14 = 6$ $2q - 14 + 14 = 6 + 14$ $2q = 20$ $\dfrac{2q}{2} = \dfrac{20}{2}$ $q = 10$

1. $5(16 - b) = 70$

$b =$ _____

2. $164 = 4(3n + 8)$

_____ $= n$

3. $4(5 - x) + 40 = 100$

$x =$ _____

4. $70d = 20(3d + 5)$

$d =$ _____

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Lesson 24 Exit Ticket

Part 1: Maureen bought 5 photos after a price increase. Each photo cost $3 more than twice the original price. Maureen paid $35 but wondered about the original price.

1. Draw a tape diagram to represent the total cost. Let p = the original price per photo.

2. Write an equation shown by the tape diagram. Write the equation in simplest terms.

   Equation = _____

3. Use the distributive property and inverse operations to solve for the variable.

   _____ = p The original price was $_____ per photo.

Part 2: Solve for the variable. Use the distributive property and inverse operations.

  4. $7(50 + y) = 476$ **5.** $4(20z - 5) = 300$

       $y =$ _____ $z =$ _____

Extra Practice: Baseball Cards

Part 1: Match the equations to their answers.

$4(16 + n) = 100$ $n = 25$

$13(n - 22) = 39$ $n = 12$

$7(n + 10) = 56$ $n = -2$

$8(42 - n) = 240$ $n = 9$

Part 2: Follow the steps to solve the problem.

1. Dylan has so many baseball cards in his collection that he needs to move the cards to new boxes. The base of the old boxes was 4 inches wide and 10 inches long. The new boxes' base is the same width but somewhat longer. The area of the base of each new box is 96 square inches.

    a. Use the tape diagram to model the area of the base of the new boxes. Use e to represent the extra length of the new boxes.
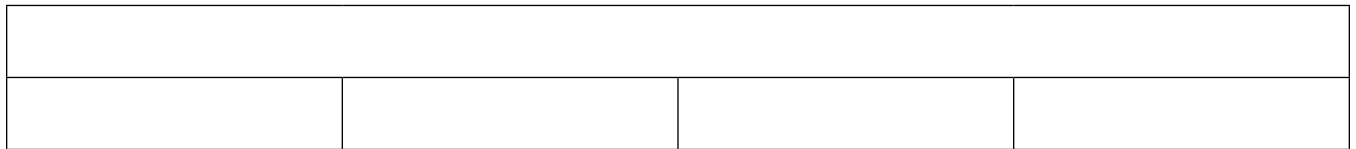
    b. Write and solve an equation for this situation. Remember, $A = l \times w$.

    The extra length of the new boxes is _____ inches.

    The total length of the new boxes is _____ inches.

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Equation Sensation Cards

Potatoes cost $4 per pound. If you buy 5 pounds or more, the price is discounted by a certain amount. Sami bought 6 pounds and paid a total of $12.

Glenn's garden was 8 feet wide and 12 feet long. He decided to expand the length. The new area of the garden is 128 square feet.

9 members of the service club raised $75 for a local food bank. Then they each personally donated the same additional amount. The total raised was $900.

Priya and 3 of her friends each have 36 marbles. Each friend gave the same number of marbles to Priya's little sister. Now Priya and her friends have 112 marbles.

Skip bought 5 burgers and milkshakes. The burgers each cost $5. The total Skip spent was $45.

Keke ordered 7 T-shirts online. Each T-shirt cost $12 and each shirt had a separate packaging fee. The total amount Keke paid was $98.

Infinite Unknowns

Use known solution methods to simplify equations with infinite and no solutions.

1. Solve for x. Show your method.

   $24x - 5 = 8(3x + 2)$

   a. Does this equation have infinite solutions or no solution? _____

   b. Explain your answer in part b. _____

   _____

2. Explain the difference between an equation with infinite solutions, an equation with one solution, and an equation with no solutions. _____

   _____

   _____

   _____

   _____

3. $4(5 + 4g) = 20 + 18g - 2g$

   a. What is the solution of the equation? _____

   b. This equation has _____ solutions.

Solutions: Infinite or None?

Review the example problem. Then use known solution methods to simplify equations with infinite and no solutions.

Example

Does the equation **2(*k* + 3) = 2*k* + 5** have infinite or no solutions?

Step 1	**Step 2**
Use the distributive property and inverse operations to simplify this equation.	Determine if the equation has infinite or no solutions.
$2(k + 3) = 2k + 5$ $2k + 6 = 2k + 5$ $2k + 6 - 6 = 2k + 5 - 6$ $2k = 2k - 1$ $2k - 2k = 2k - 1 - 2k$ $0 \neq -1$	**Infinite:** solution is always true **None:** solution is never true **0 = −1** is never true. This equation has no solutions.

1. Tobias has to figure which of the two equations has infinite solutions.

<table>
<tr><td align="center">**Equation 1**</td><td align="center">**Equation 2**</td></tr>
<tr><td align="center">$4x + 6 - 2x = 2x + 19 - 13$</td><td align="center">$7 + 5x = -9 + 8x - 3x$</td></tr>
</table>

   a. Solve Equation 1.

                                     b. Solve Equation 2.

   c. Which equation is always true? Which equation is never true?

      Always true: _____

      Never true: _____

   d. Which equation should Tobias say has infinite solutions? _____

2. Victoria said the equation $12t + 5 = 2(6t + 3)$ has infinite solutions. Is Victoria correct? Explain.

_____

_____

Lesson 25 Exit Ticket

Solve the following equations for the variable. Determine if the equation has no solutions or infinite solutions.

1. $3(3y + 6) - y = 4 + 8y + 14$

How many solutions does this equation have? _____

2. $7(2m - 3) + 5 = 34m - 16 - 6m$

How many solutions does this equation have? _____

Extra Practice: How Many Solutions?

Part 1: Complete the following statements with sometimes, always, or never.

1. An equation can _____ have no solutions.

2. When solving for a variable, you will _____ need to use the distributive property.

3. An equation is _____ true if it has infinite solutions.

4. If an equation has no solutions, it is _____ true no matter what value is substituted for the variable.

Part 2: For the following equations, circle the ones that have infinite solutions, draw a rectangle around the ones that have one solution, and draw a triangle around the ones that have no solutions.

$3w - 12 = 3(w - 4)$

$11x + 2 = 11x - 6$

$22d + 8 + 2d = 6(4d) + 16$

$15 - 6p + 2p = -2(2p - 1) + 13$

$17j + 8 = 12j - 8 + 5j$

$36 - 9g = 9(5 - g) - 9$

$2n = 11n + 45$

$25f - 30 - 15 = 5(5f + 9)$

Part 3: Use known solution methods to determine if equations have no solution or infinite solutions and answer questions.

5. Jesslyn said the equation $4(8m - 3) + 20 = 32m - 8$ has no solutions.

   a. Show the solution to this equation.

   b. Is Jesslyn correct? Explain. _____

_____

Where Do I Belong?

$36x - 12 + 4x = 5(8x + 2) + 2$

$17a + 5 - 2a = 15a + 1$

$14 - 9c = -5c + 6 - 4c$

$2(8 + d) = 6 + 2d + 10$

$3(2q - 2) = 2(3q - 3)$

$12 + 14n = 2(7 + 7n)$

Read-a-Thon

Read the problems and answer the questions.

1. Bailey is participating in a read-a-thon. For every hour she reads, she earns 15 tokens.

   a. Complete the table to show the process, the tokens collected, and the ordered pairs.

Hours Read (x)	Process	Tokens Earned (y)	Ordered Pairs (x, y)
1	1 × _____		
2	2 × _____		
3	3 × _____		
4	4 × _____		
x	x · _____	y	

   b. What is the equation for the relationship? _____

   c. Graph the relationship on a **coordinate plane**.

2. Carly is running laps to raise money for a classmate to buy a Seeing Eye dog. Her sponsors will give her $3 for each lap.

   a. Complete the table to show the process, the money raised, and the ordered pairs.

Laps Run (x)	Process	$ Raised (y)	Ordered Pairs (x, y)
1	1 × _____		
2	2 × _____		
3	3 × _____		
x	x · _____	y	

   b. What is the equation for the relationship? _____

   c. Graph the relationship on a **coordinate plane**.

Wilderness Warriors

Review the example problem. Then create a data table and write an equation to represent the given proportional relationship and answer questions.

Example

The Wilderness Warriors club is selling its honey to raise money for a pollinator garden in town.
For every **1** jar of honey sold, the club earns $**2**.

Step 1

Write a ratio to represent the relationship.

For every **1** jar sold, the club earns $**2**.

The ratio is **2** dollars:**1** jar, or **2:1**.

Step 2

Determine the relationship between the two quantities.

Since **1** × 2 = **2**, the relationship is ×2.

Step 3

Use the relationship between the two quantities to define a process for finding y, given x. Complete a data table.

Jars Sold (x)	Process	Dollars Earned (y)
0	0 × 2	0
1	1 × 2	**2**
2	2 × 2	4
3	3 × 2	6
4	4 × 2	8
x	$x \cdot 2$	y

Step 4

Write an equation in the form of **$y = mx$**, in which m is the constant of proportionality.

Each y-coordinate is 2 times the x-coordinate, so the equation is $y = 2x$.

1. The Wilderness Warriors are selling suet for $5 a package.

Packages Sold (x)	Process	$ Earned (y)
0		
1		
2		
3		
4		
5		

Equation: _____

2. The Wilderness Warriors are selling milkweed plants for $9 each.

Plants (x)	Process	$ Earned (y)
0		
1		
2		
3		
4		
5		

Equation: _____

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Lesson 26 Exit Ticket

Part 1: Springer Middle School is holding its Spring Carnival fundraiser. Freddie bought 6 tickets for $1. Answer the questions to represent the given proportional relationship.

1. Complete the data table to model the relationship.

Cost (dollars) (x)	Process	Tickets (y)	Ordered Pairs (x, y)
0			
1			
2			
3			
4			

2. Graph the ordered pairs from the table in the coordinate plane.
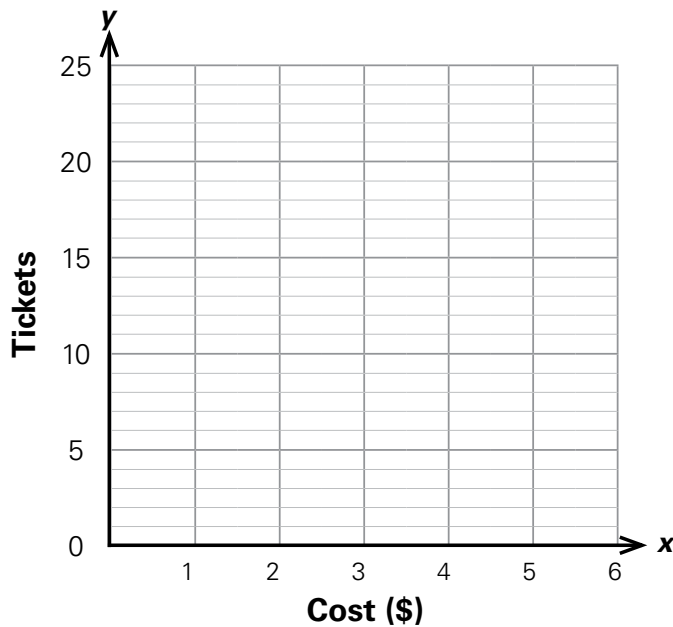
3. What equation represents this relationship? _____

Part 2: Indicate whether each statement is true or false.

4. A line representing a proportional relationship never passes through the origin of a coordinate plane. _____

5. The constant of proportionality is always found at the point (1, y) on the graph of a proportional relationship. _____

6. A proportional relationship's graph is never a straight line. _____

Extra Practice: Space Maze

Answer the questions below about proportional relationships, equations, and graphing ordered pairs.

1. In a video game called *Space Maze*, players can earn equipment for their avatar by solving equations. Graph the equations below. Match the equipment earned to its equation.
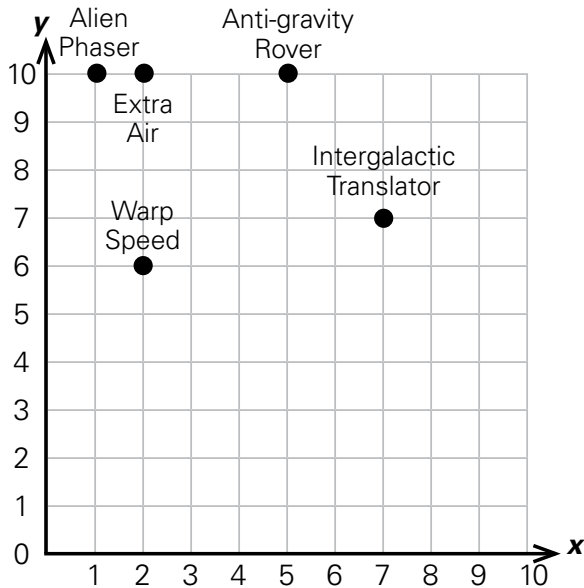
Equation	Equipment
$y = 10x$	
$y = 5x$	
$y = 3x$	
$y = 1x$	
$y = 2x$	

The graph shows points labeled: Alien Phaser, Anti-gravity Rover, Extra Air, Intergalactic Translator, Warp Speed.

2. In order to fight invaders, players must reach level 20 by writing equations to represent lines with specific constants of proportionality as fast as possible. Would you reach level 20? Go!

Constant of Proportionality	Equation
4	
15	
30	

3. Charlotte is playing *Space Maze*. For every level she completes, she gets 12 space diamonds, which can be used to buy fuel for her spaceship.

a. What is the constant of proportionality in this relationship? _____

b. Complete the table to show the process, the diamonds collected, and the ordered pairs.

c. What is the equation for this relationship? _____

Levels Completed (x)	Process	Diamonds Earned (y)	Ordered Pairs (x, y)
0	$0 \times$ _____		
1	$1 \times$ _____		
2	$2 \times$ _____		
3	$3 \times$ _____		
x	$x \cdot$ _____	y	

Coordinate Plane
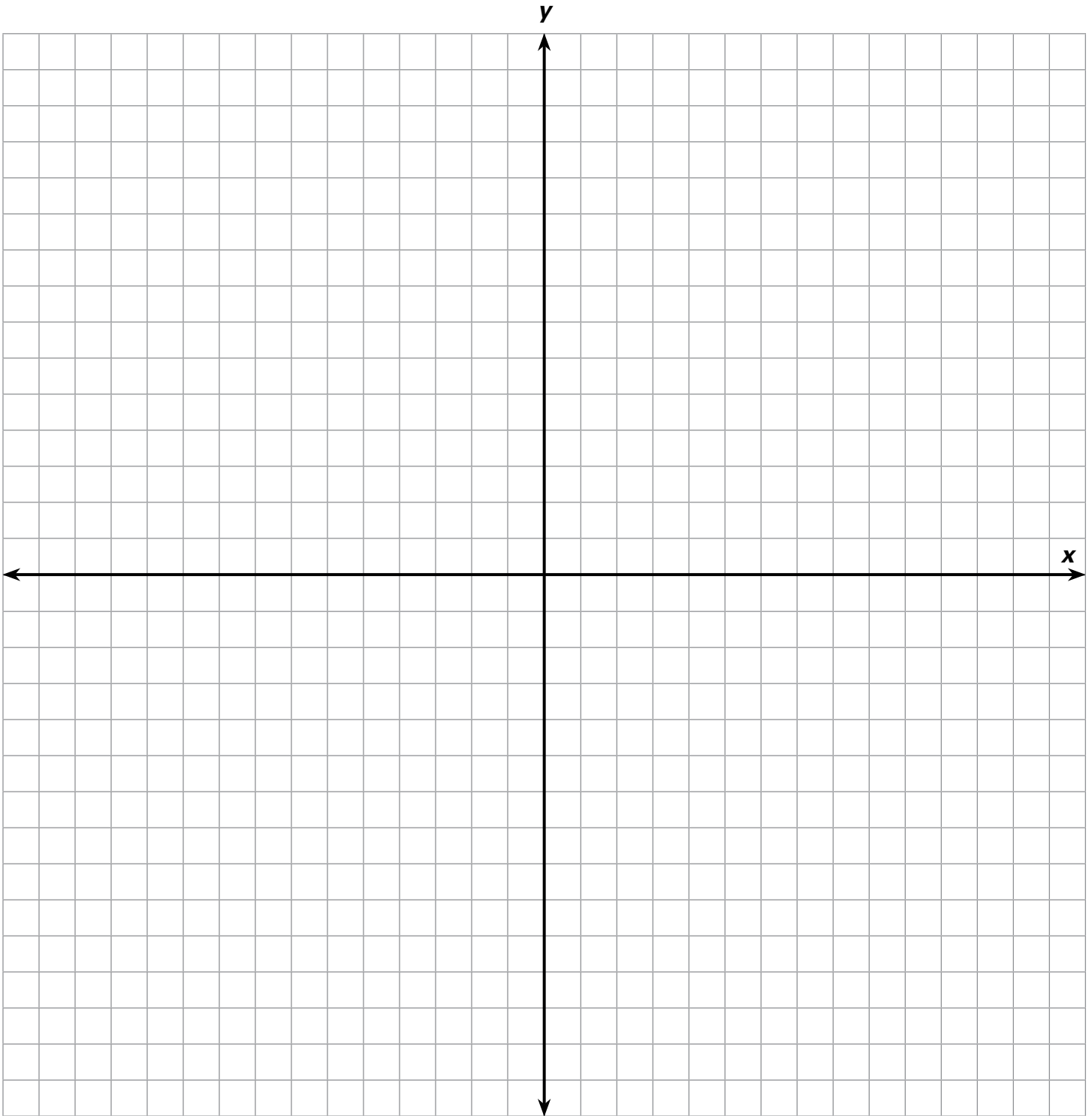
Find-a-Match

For every dog he walks, Kevin earns $3.

For every coffee she buys, Erin pays $2.

Michelle can run 8 miles in an hour.

David reads 10 pages of his book for every 1 page of math homework he completes.

Marisol can buy 7 plums for $1.

Enrique goes on 4 trips every year.

Maddy works out 5 days for every 1 day she rests.

One candy bar costs $1.

Family Fun

Part 1: Answer the questions about the proportional relationship represented by the graph.

1. In each of the past 5 years, more people have shown up for the family reunion weekend, as shown in the graph. The number of attendees grew proportionally over the years.
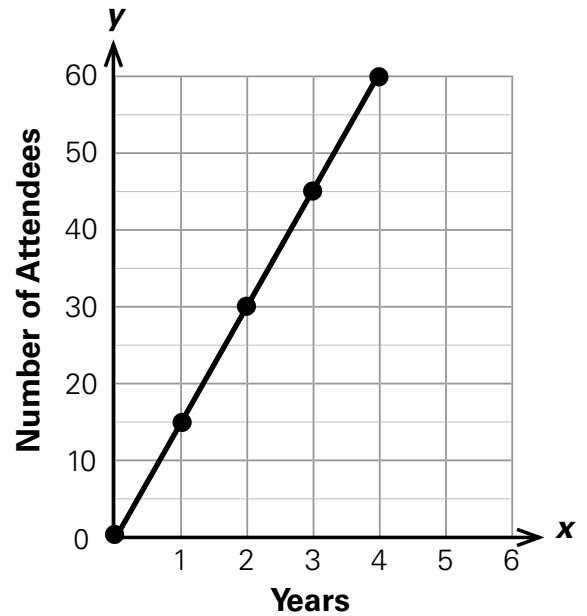
    a. What is the constant of proportionality?

    _____

    b. What is the equation for this relationship?

    _____

    c. Complete the data table for the other years using the constant of proportionality.

Years (x)	Process	Number of Attendees (y)	Ordered Pairs (x, y)
6	6 × _____		
9	9 × _____		
10	10 × _____		
15	15 × _____		

Part 2: Identify the constant of proportionality in each equation.

2. $y = 24x$ Constant of proportionality: _____

3. $y = 6x$ Constant of proportionality: _____

4. $y = \dfrac{1}{2}x$ Constant of proportionality: _____

Golden Trophies

Review the example problem. Then read the problems and answer the questions.

Example

We order **4** boxes of trophies for family race day. The **4** boxes weigh **24** pounds. How can we represent this relationship between number of boxes and weight?

Step 1

Write the known ratio in a data table.

I know that **4** boxes weigh **24** pounds.

Boxes (x)	Process	Pounds (y)
0		
1		
2		
3		
4		**24**

Step 2

Identify the process for finding y given x. The multiplier is the constant of proportionality. Use it to complete the rest of the table.

Boxes (x)	Process	Pounds (y)
0	$0 \times 6 = 0$	0
1	$1 \times 6 = 6$	6
2	$2 \times 6 = 12$	12
3	$3 \times 6 = 18$	18
4	$\mathbf{4} \times 6 = \mathbf{24}$	**24**

Since **4** × 6 = **24**, the constant of proportionality is 6.

Step 3

Use the x and y columns of the table to graph the ordered pairs.
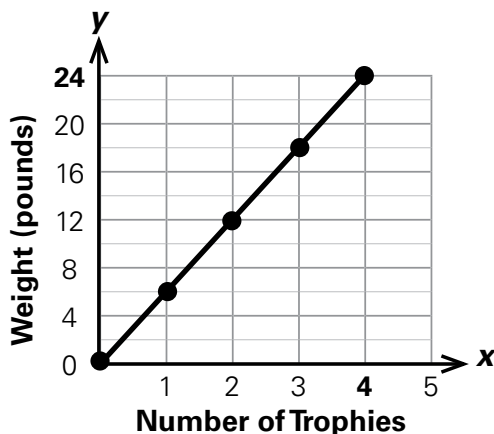
Step 4

Use the graph to determine an equation in the form of
$y = mx$, where m is the constant of proportionality.

The constant of proportionality is 6, so the equation is
$y = 6x$.

---

1. Before our family reunion, we ship the trophies to the resort where we stay. We can fit 4 trophies in each box.

Complete a **data table** and **coordinate graph** for this relationship.

Equation: _____

2. At the post office, we find out that 4 trophies cost $28 to ship.

Complete a **data table** and **coordinate graph** for this relationship.

Equation: _____

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Lesson 27 Exit Ticket

Use the representations of proportional relationships to answer the questions.

1. What is the constant of proportionality represented by the graph?

   The constant of proportionality is _____.

2. For the cookie race, where everyone tries to get a cookie from their forehead to their mouth without touching or dropping it, each contestant gets 7 cookies.

   a. What is the equation that represents this proportional relationship? _____

   b. What is the constant of proportionality in this equation? _____

   c. Complete the data table for the given numbers of contestants.

Contestants (x)	Process	Cookies (y)	Ordered Pairs (x, y)
5			
8			
11			
14			

   d. Graph ordered pairs for 0, 1, 2, 3, and 4 contestants in the coordinate plane. Be sure to title the axes.
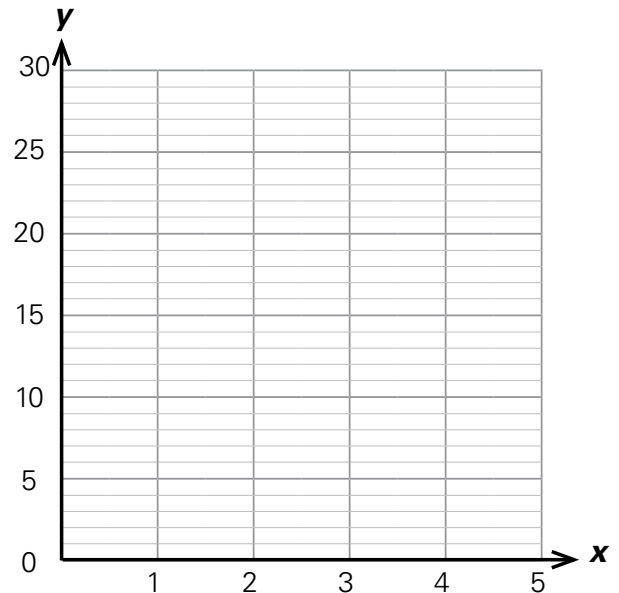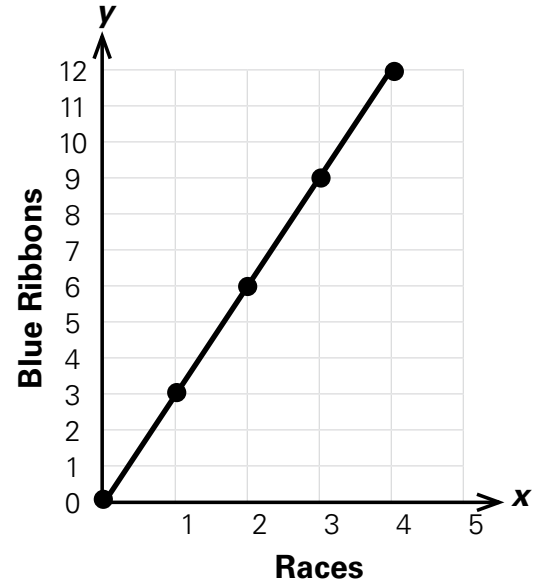
Extra Practice: Party Prep

Answer the questions about the proportional relationships.

1. Connie is budgeting for her upcoming party. She is already spending $36 on apples. She also wants butternut squash to make a soup. The equations below show the price per pound at different local farms. Match the equation to the ordered pairs so Connie can graph them.

   $y = 2x$ (1, 3), (4, 12), (5, 15), (12, 36)

   $y = 8x$ (3, 27), (5, 45), (9, 81), (10, 90)

   $y = 3x$ (1, 2), (2, 4), (5, 10), (8, 16)

   $y = 6x$ (0, 0), (3, 24), (4, 32), (7, 56)

   $y = 9x$ (0, 0), (2, 12), (6, 36), (11, 66)

2. Connie is calculating the number of napkins she needs to buy depending on how many each guest uses. Graph each equation in the coordinate plane. Identify the constant of proportionality.
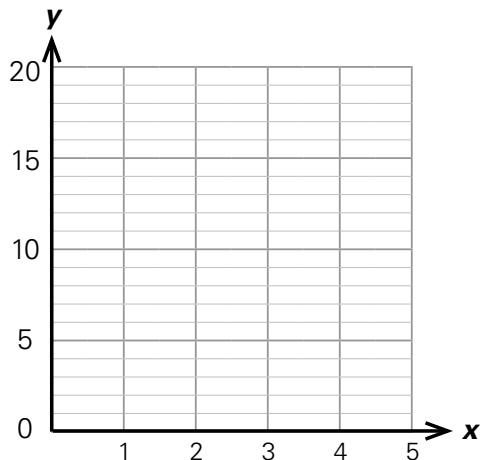
Equation: $y = 5x$
Constant of proportionality: _____
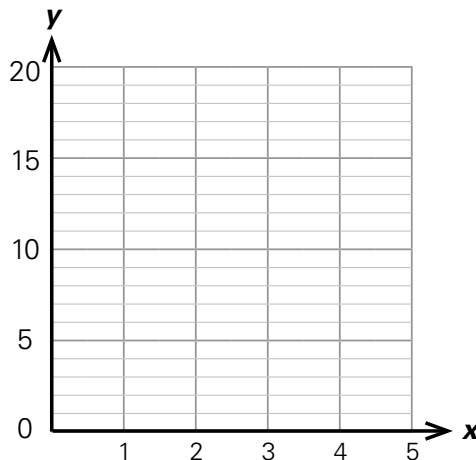
Equation: $y = 2x$
Constant of proportionality: _____

3. Connie is famous for her quiche. She needs to know how many cartons of eggs she should buy based on a recipe she has. Complete the data table for 12 eggs in a carton.

Cartons (x)	Process	Eggs (y)	Ordered Pairs (x, y)
4			
9			
12			
15			

Ratio Tables

(x)	(y)

(x)	(y)

(x)	(y)

(x)	(y)

Skipping Race Champion Coordinate Plane and Table
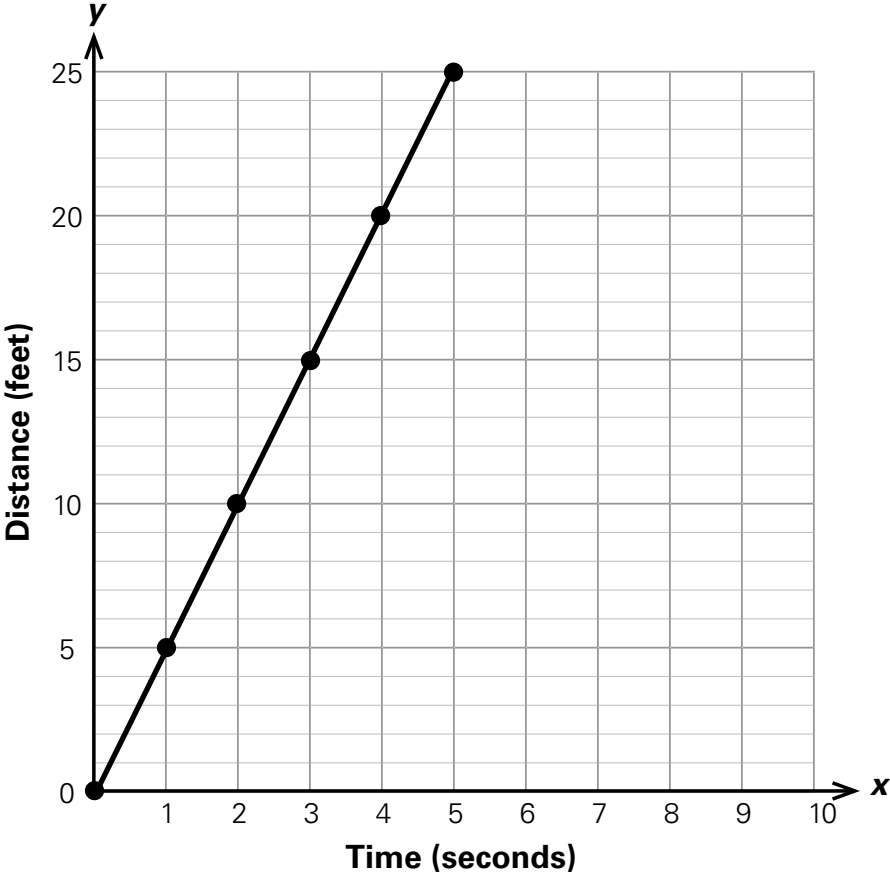
Time in Seconds (x)	Process (x · m)	Distance in Feet (y)	Ordered Pairs (x, y)
x		y	

Speedy Animals

Compare two different proportional relationships by converting them to the same representation.

1. The top speed of a zebra is represented by the equation $y = 64x$. The top speed of a horse is shown in the data table.

a. Explain how you could compare these relationships to find out which animal is the fastest.

_____

_____

_____

_____

Speed of Horse

Time (hours) (x)	Distance (km) (y)
0	0
1	88
2	176
3	264
4	352

b. What is the equation for the horse's speed? _____

c. What is the constant of proportionality for each animal?

Zebra: _____

Horse: _____

d. Complete the data table for the zebra's speed for x-values of 0–4.

e. Using ordered pairs from the two data charts, graph each animal's speed on a **coordinate plane** to determine which animal is faster.

Speed of Zebra

Time (hours) (x)	Distance (km) (y)
0	
1	
2	
3	
4	

A _____ is faster than a _____.

Wide, Wild World

Review the example problem. Then compare the proportional relationships to the ones presented in the example problem. On **writing paper**, order the four networks from most to least expensive, and explain how you know the order is correct.

Example

The cost to stream *Wild TV* is represented by the graph. The cost to stream *Predators Alive!* is represented by the data table. Which channel is more expensive to stream?

Step 1

Convert the graph to an equation.

Wild TV
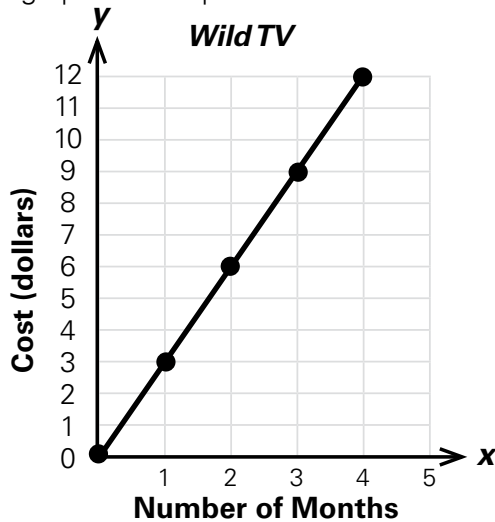
Equation: $y = 3x$

Step 2

Convert the relationship shown in the table to an equation.

Predators Alive!

Number of Months (x)	Cost (dollars) (y)
0	0
1	4
2	8
3	12
4	16

Equation: $y = 4x$

Step 3

The greater constant of proportionality indicates a greater rate of change.

Wild TV constant of proportionality: 3   *Predators Alive!* Constant of proportionality: 4

Predators Alive! is more expensive.

Outside Inside

Number of Months (x)	Cost (dollars) (y)
0	0
1	2
2	4
3	6

Circle the network that is more expensive.

Wild TV   *Outside Inside*

World Wonders
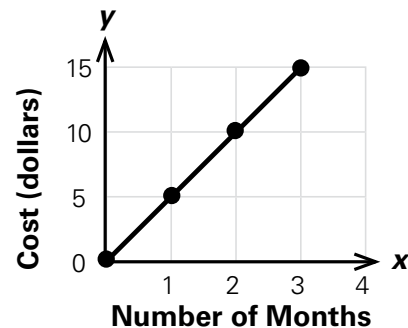
Circle the network that is more expensive.

Predators Alive!   *World Wonders*

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Lesson 28 Exit Ticket

Compare the proportional relationships using the given representations.

Freshwater Ducks

Clutch (*x*)	Eggs (*y*)
0	0
1	11
2	22
3	33
4	44

1. A study by a bird conservation group has shown that shorebirds lay eggs at a rate of 3 per clutch. Freshwater ducks, however, lay eggs at the rate shown in the table below.

   a. What equation represents the number of shorebirds' eggs per clutch? _____

   b. What equation represents the number of freshwater ducks' eggs per clutch? _____

   c. Which bird lays more eggs per clutch? How do you know? _____

   _____

   _____

2. The graph shows the speeds for a pig and a mouse.

   a. Explain how to compare the two lines to determine which animal is faster.

   _____

   _____

   _____

   _____

   _____

   b. A _____ is faster than

   a _____.
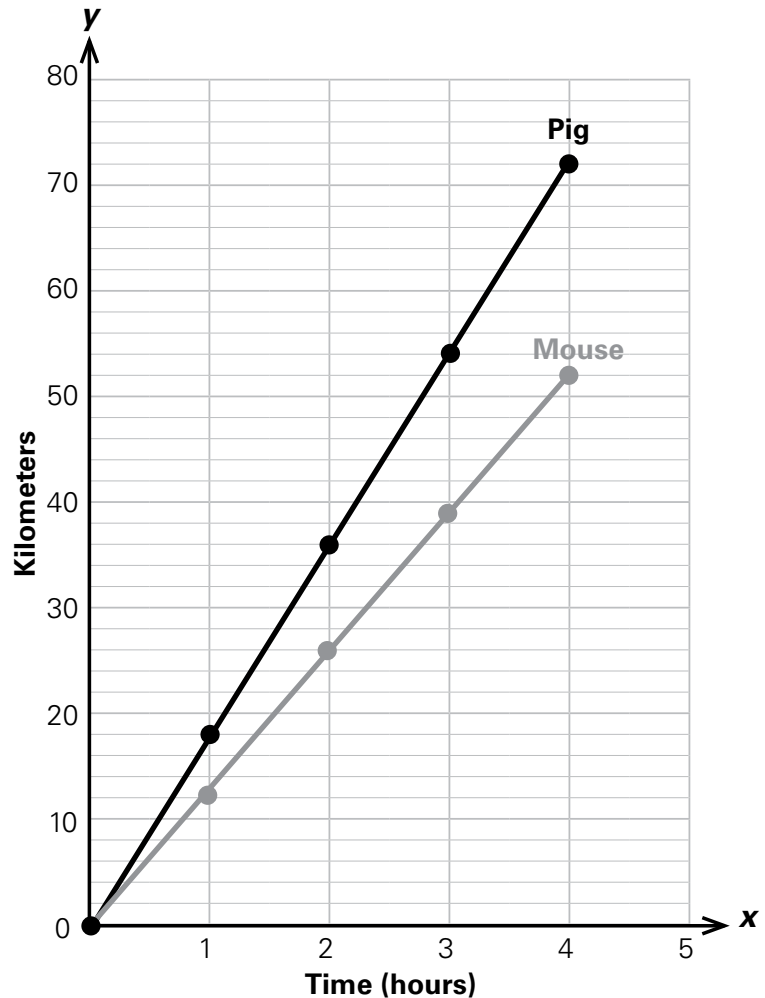
Extra Practice: The Better Deal

Part 1: Complete the following statements with *sometimes*, *always*, or *never*.

1. It is _____ easier to compare two relationships using graphs.

2. You should _____ convert the relationships you are comparing into the same representations.

3. You can _____ find the value of the constant of proportionality by finding the value of x when $y = 1$.

4. The steeper line on a graph _____ has a greater unit rate.

Part 2: Use data tables, equations, and graphs to compare the proportional relationships.

5. Jayden is comparing the prices of two brands of toothpaste. Sparkle toothpaste's cost in cents per ounce is represented by the equation $y = 25x$ and Dazzle toothpaste's cost is 28 cents per ounce.

   a. Create a set of ordered pairs for 0 through 4 ounces for each brand of toothpaste.

   Sparkle: _____

   Dazzle: _____

   b. Graph both relationships on a coordinate plane. Be sure to title both lines and both axes.

   c. Which toothpaste brand is less expensive? _____

6. The equation, data table, and graph show the price of different Bluetooth speakers.

Volume 11:

Number of Speakers (x)	Price (dollars) (y)
0	0
1	29
2	58
3	87
4	116

Ear Worms:
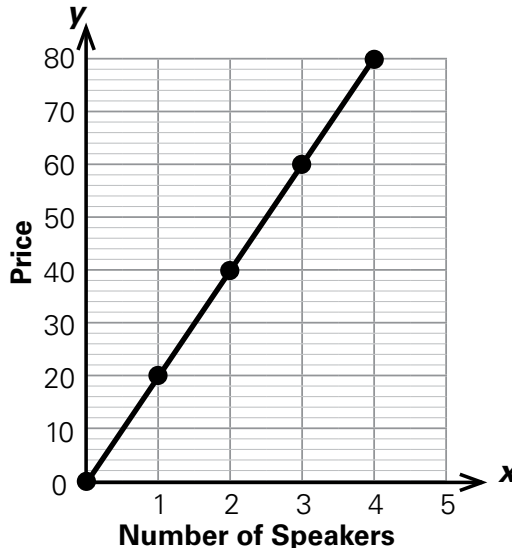
Boom Box: $y = 32x$

List the speakers in order of least to most expensive.

_____

_____

_____

Coordinate Plane
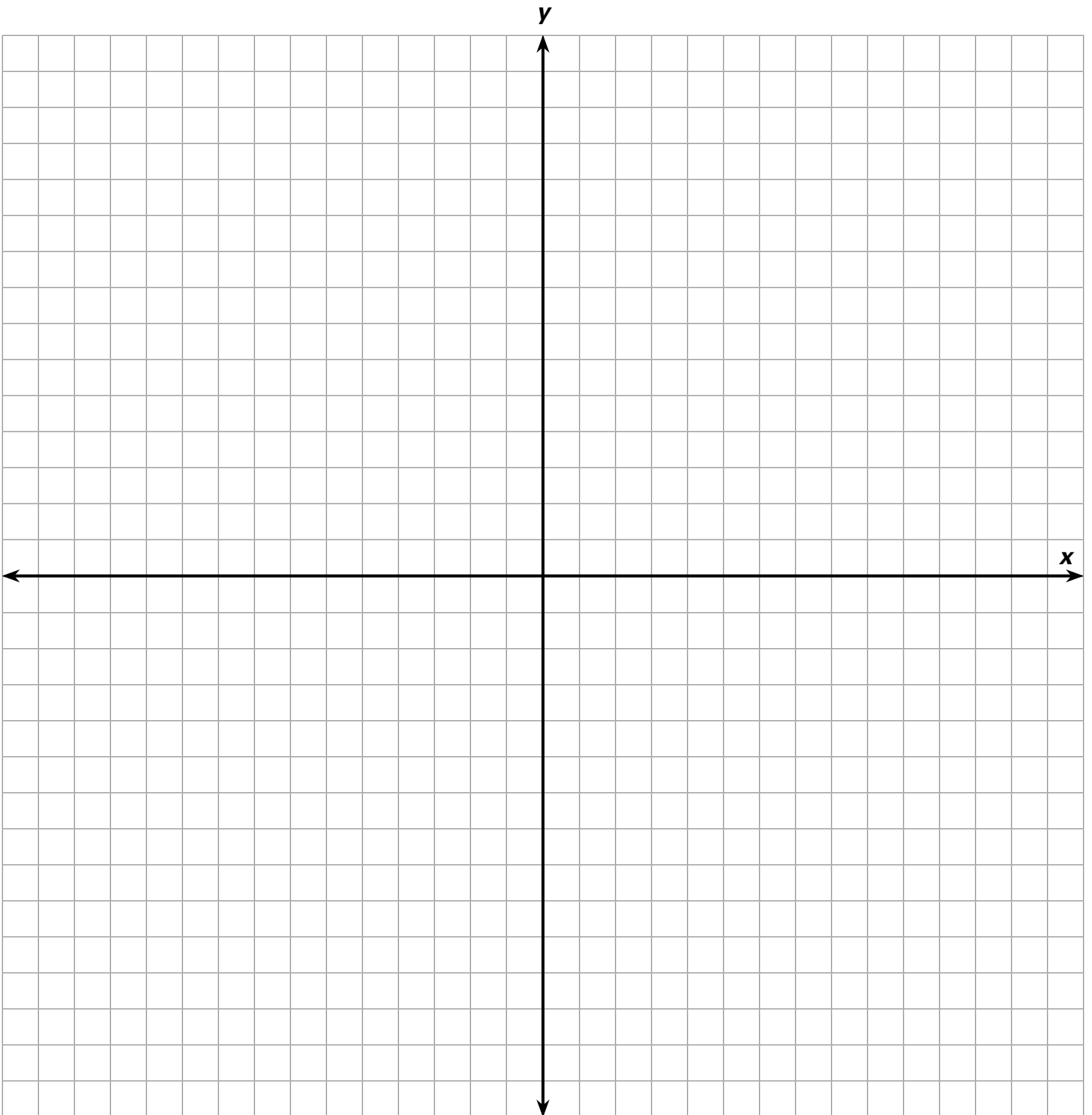
Cheetah vs. Lion

Cheetah

Ordered pairs:

_____   _____   _____   _____   _____

Lion

Time (hours) (*x*)	Process	Distance (km) (*y*)	Ordered Pairs (*x, y*)
0		0	
1		80	
2		160	
3		240	
4		320	

Cheetah vs. Lion

y

Distance (km)

500
400
300
200
100
0

Time (hours)

1   2   3   4

x
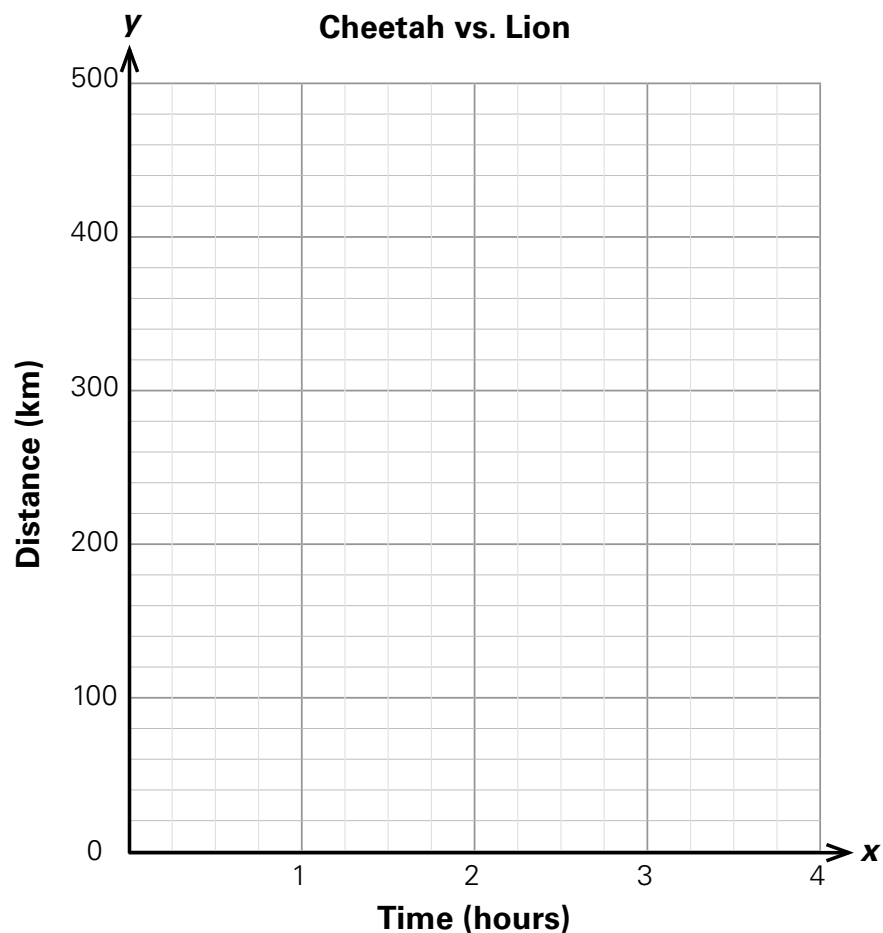
Coyote vs. Roadrunner

Coyote

$y = 69x$

Roadrunner

Speed of Roadrunner
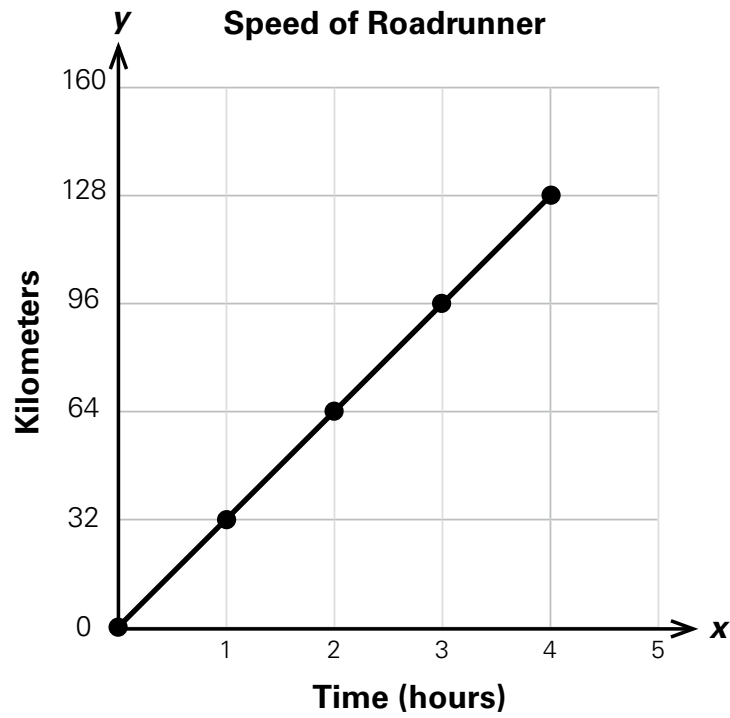
Assessment

Unit 3 Assessment

1. Ricardo has 56 marbles. Together, Ricardo and Jessie have 94 marbles.

    a. Draw a tape diagram to represent this situation. Use a variable to represent the unknown.

    b. Write and solve an equation to determine how many marbles Jessie has.

        Jessie has _____ marbles.

2. Amaris is making copies of a flyer for the school carnival. She has completed 150 copies of the flyers which is ¾ of the total number she needs to make.

    a. Draw a fraction bar to model the total number of copies Amaris needs to make. Use the variable c for the unknown.

    b. Write and solve a multiplication equation to determine the total number of copies Amaris needs to make.

        $c =$ _____

3. Tyreek is digging a garden in his backyard. The perimeter of the garden is 24 feet and the length is two times the width. Use the formula $P = 2l + 2w$.

    a. Draw a tape diagram to represent the perimeter using one variable.

    b. The width of Tyreek's garden is _____ feet, and the length is _____ feet.

4. Solve for g. Show your work.

$3(g - 10) = 27$

    $g =$ _____

5. Simplify the equation. Show your work and answer the question.

$12x + 4 = 6(2x - 1)$

Does the equation have one solution, infinite solutions, or no solutions?

_____

6. Solve the equation for the variable. Show your work and answer the question.

$5(3b + 2) = 20b + 10 - 5b$

Does the equation have one solution, infinite solutions, or no solutions?

_____

7. Each box of Yummy's Snacks has 15 individual packages of crackers.

  a. Complete the table to show the process, the number of individual packages, and the ordered pairs.

Boxes of Yummy's (x)	Process	Individual Packages (y)	Ordered Pairs (x, y)
0			
1			
2			
3			
4			

  b. What is the equation for this proportional relationship? _____

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8. Quentin is working with the equation $y = 26x$.

   a. Is this a proportional relationship? Explain. _____

_____

_____

   b. What is the constant of proportionality of the equation $y = 26x$? _____

9. At the grocery store, the cost per pound of bananas is represented in the graph shown.
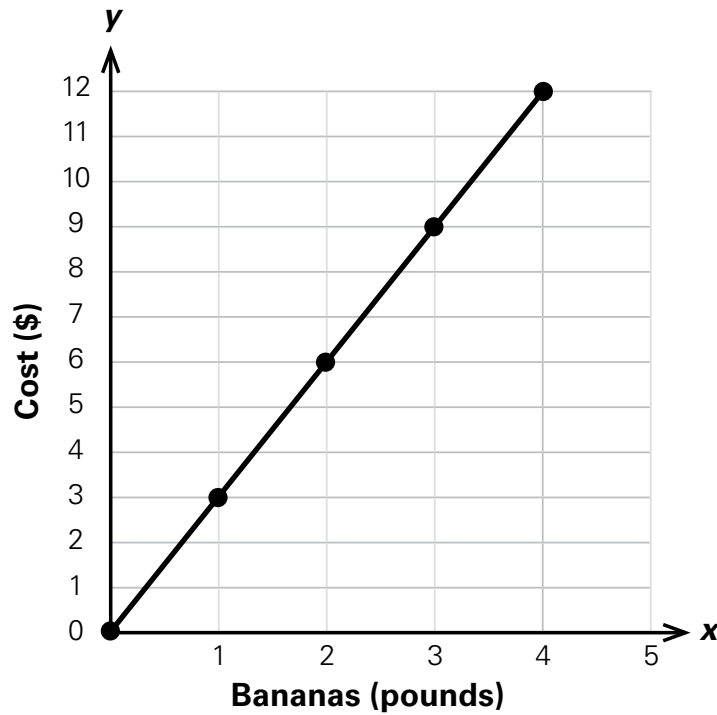
The constant of proportionality shown in this graph is _____, which means that bananas

cost $_____ per pound.

10. The prices for two brands of jeans are represented in the table and on the graph.

Number of Brand A Jeans Bought (x)	Cost ($) (y)
3	60
4	80
5	100

Number of Brand B Jeans Bought
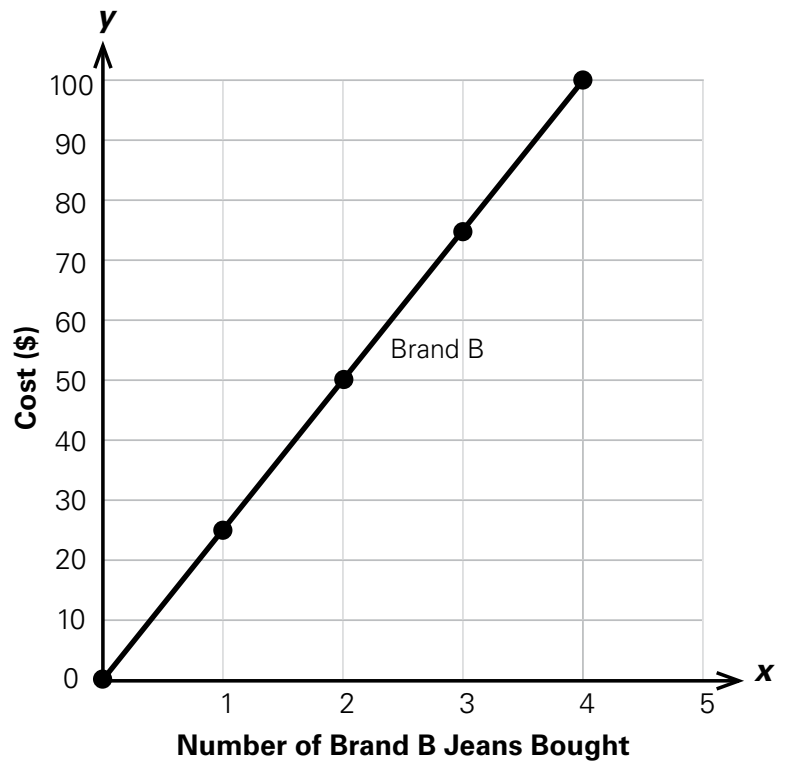
a. Which brand of jeans is more expensive (with the higher price per pair)? _____

b. How do you know? _____

_____

_____

_____

_____

STOP

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Unit 3 Cumulative Review

1. Solve the inequality and graph the solution on the number line.

$c + 5 > 12$
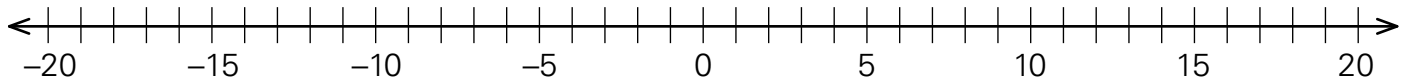
2. Is the relationship shown in the table below proportional? Explain.

Column 1	Column 2
4	12
5	15
9	27
12	36
15	45

_____

_____

_____

_____

3. Simplify each expression.

$4^{-3} =$ _____

$2^{-5} =$ _____

$9^{-1} =$ _____

4. Aurora is comparing the cost of two different brands of cereals' cost per ounce. Corn Squares cost 27 cents per ounce. Fruity Flakes' cost per ounce is shown in the table.

Fruity Flakes (ounces) (x)	Cost (cents) (y)
0	0
1	32
2	64
3	96
4	128

Which brand is less expensive per ounce? _____

5. Graph the equation $y = 6x$ on a coordinate plane for $x = 0$ through 4.
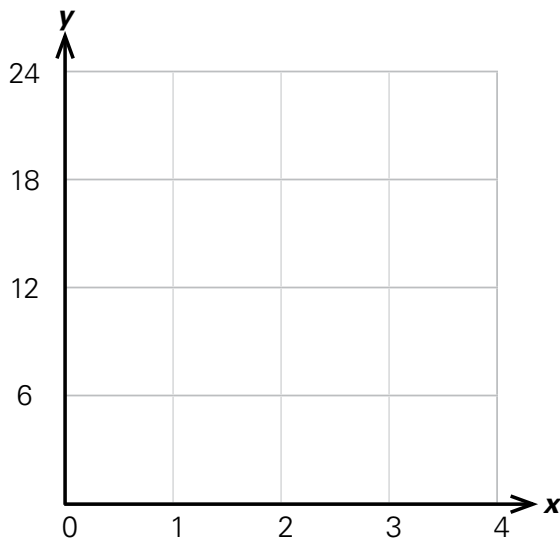
6. Match each fraction with its corresponding decimal.

$\dfrac{3}{8}$ $0.\overline{4}$

$\dfrac{5}{6}$ 0.375

$\dfrac{2}{10}$ 0.2

$\dfrac{4}{9}$ $0.8\overline{3}$

7. The tape diagram represents the sum of two consecutive numbers that add up to 29. Combine like terms to find the two consecutive numbers.

29	
n	$n + 1$
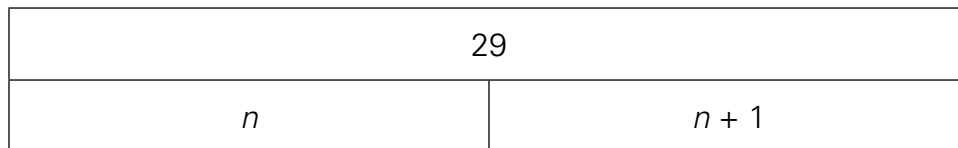
The two consecutive numbers are _____.

8. What ordered pair is on every line representing a proportional relationship? _____

9. Mercedes is going to the movies. It will cost her a total of $24. This includes her movie ticket, which is $10, and popcorn and a drink. The popcorn and the drink each cost the same amount.

Write an equation and use it to find out how much the popcorn and the drink each cost.

_____

How much do the popcorn and the drink each cost? _____

10. Jazmine bought a pair of running shoes. The shoes cost $36, but Jazmine had a coupon for 20% off the price.

How much did Jazmine pay for the shoes? _____

11. Solve. Show your work.

$9.3 \times 10^6 - 6.8 \times 10^5 =$ _____

12. Iris built a sculpture for her backyard. The sculpture is 2 feet wide and 6 feet tall. Iris likes the sculpture so much she has decided to build a smaller version to keep in her room. She is going to reduce the sculpture by a factor of 0.25.

The reduced sculpture dimensions will be _____ feet wide and _____ feet tall.

13. Solve for w. Show your work.

$8w = 112$

$w =$ _____

14. Naomi is painting a portrait of her dog, Scamp. The canvas Naomi is using is a square with a side length of 12 inches.

a. Draw a model to represent Naomi's canvas.

b. Write an equation for finding the area of Naomi's canvas using exponents. _____

c. What is the area of Naomi's canvas? _____

15. Edith solved the equation as shown.

$$\left(\frac{2}{6}\right)k = 18$$

$$\left(\frac{2}{6}\right)k \times \frac{2}{6} = 18 \times \frac{2}{6}$$

$$k = 6$$

a. What mistake did Edith make? _____

_____

b. What is the correct value of *k*? Show your work.

$k =$ _____

Unit 4:
Represent Linear Relationships

Let's Bowl!

Part 1: Read the problems and answer the questions.

1. Talia and Eric are entering a bowling tournament. In the Bowl-a-Rama Tournament, the cost per game is $7 to use the lanes. There is also a $5 fee for entering the tournament.

   a. Write an equation to represent this situation. _____

   b. What is the *y*-intercept? _____

   c. What does the *y*-intercept represent in this relationship? _____

   _____

2. The bowling alley has an awards program that gives regular customers special deals. You earn 500 points just for signing up for the program, then you earn 50 points every time you play a game.

   a. Write an equation to represent this situation. _____

   b. What is the *y*-intercept? _____

   c. What does the *y*-intercept represent in this relationship? _____

   _____

Part 2: Review each data table and answer the questions.

3. The table shows prices of pizzas at the bowling alley with different numbers of toppings.

   a. What is the *y*-intercept? _____

   b. What does the *y*-intercept represent in this relationship?

   _____

   _____

Number of Pizza Toppings (*x*)	Price in Dollars (*y*)
0	12
1	13
2	14
3	15

4. The table shows prices to play games inside the bowling alley's video arcade.

   a. What is the *y*-intercept? _____

   b. What does the *y*-intercept represent in this relationship?

   _____

   _____

Number of Games (*x*)	Price in Dollars (*y*)
0	3
1	5
2	7
3	9

Find the *y*-Intercept

Review the example problem. Then identify the *y*-intercept in each problem.

Example

The graph shows the cost for renting a bowling alley per hour, including a booking fee. What is the *y*-intercept in the graph of the linear relationship? What does the *y*-intercept mean?

Cost ($)

Hours Played
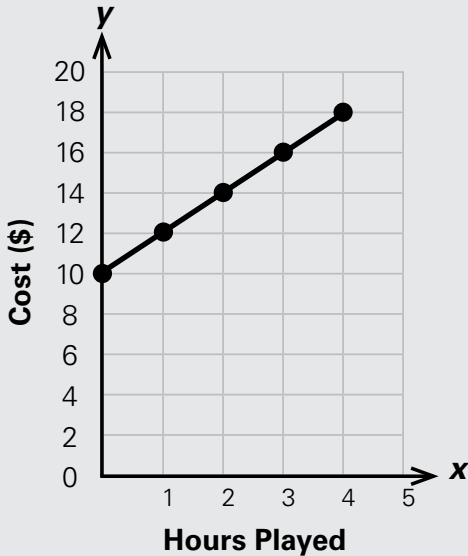
Step 1

Find the *y*-intercept on a graph by looking at where the line crosses the *y*-axis.

The line crosses the *y*-axis at (0, 10), so the *y*-intercept is 10.

Cost ($)

Hours Played
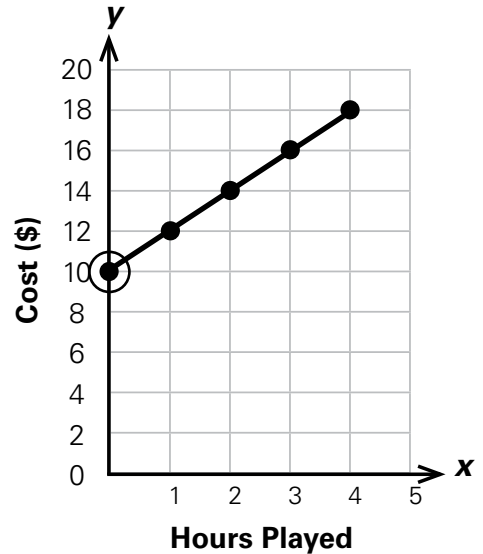
Step 2

Use the information from the graph to interpret the *y*-intercept.

Since the cost is $10 before the first hour of playing, the *y*-intercept means that the booking fee is $10.

---

1. The graph reflects the prices for large bags of chips, plus a credit Billy has at the snack shop.

Price

Number of Bags
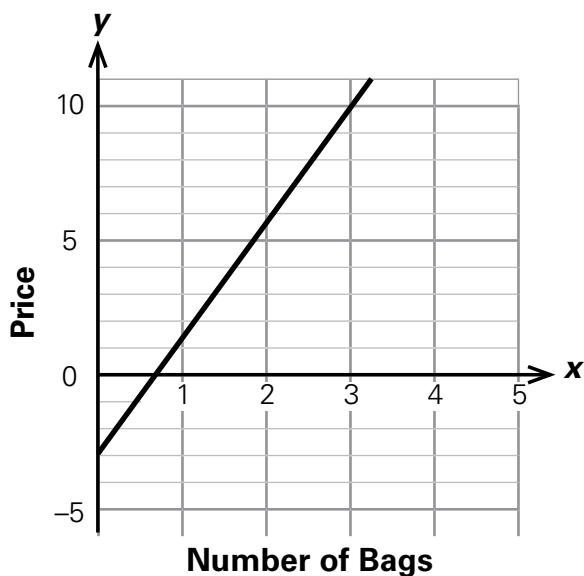
What is the *y*-intercept? _____

What does the *y*-intercept mean? _____

_____

_____

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Lesson 30 Exit Ticket

Part 1: Blue Sky Middle School is having T-shirts printed for the incoming sixth graders. The company making the T-shirts charges $15 for art setup, and the cost per T-shirt is $3. Answer the questions about this situation.

1. Write an equation to represent the total cost for the T-shirts. _____

2. What is the *y*-intercept of this relationship? _____

3. What does the *y*-intercept represent in this relationship? _____

Part 2: Identify the *y*-intercept in each representation of a linear relationship.
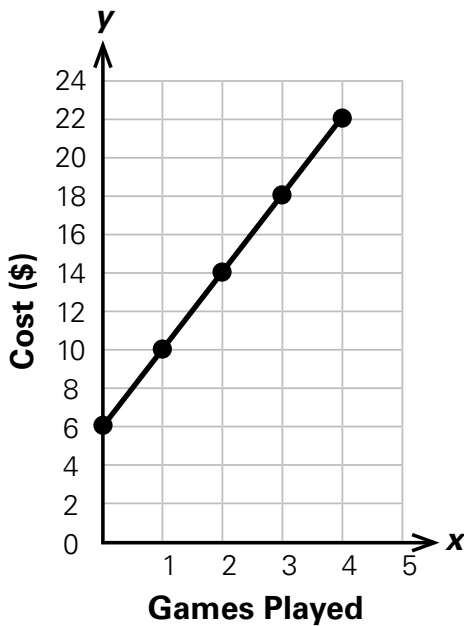
Equation: $y = 25x + 42$

x	y
0	8
1	13
2	18
3	23
4	28

4. What is the *y*-intercept in the graph? _____

5. What is the *y*-intercept in the equation? _____

6. What is the *y*-intercept in the table? _____

Extra Practice: Online Ordering

Part 1: Determine whether the following statements are *true* or *false*.

1. The *y*-intercept of a linear relationship is an amount added to or subtracted from the *mx* term in the equation. _____

2. The *y*-intercept is where the line crosses the *x*-axis. _____

3. You can identify the *y*-intercept of a linear relationship using an equation, data table, or graph.

    _____

4. A *y*-intercept can be a positive or negative number. _____

5. A linear relationship graph always goes through the origin. _____

Part 2: Match the equations with the correct *y*-intercept.

$y = 4x + 12$ -4

$y = 8x - 10$ 12

$y = 4x + 3$ 8

$y = 10x + 8$ 3

$y = 5x - 4$ -10

Part 3: Read the real-world question below. Identify and interpret the *y*-intercept in the linear relationship it represents. Choose your method: **equation, data table, or graph**. Show your work.

6. Ellen is ordering pairs of socks from an online company. The cost of the socks is $6 per pair. There is also a $9 shipping fee no matter how many pairs Ellen orders.

    a. What is the *y*-intercept of this relationship? _____

    b. What does the *y*-intercept represent? _____

    _____

    c. How much will it cost Ellen to buy 7 pairs of socks? _____

Coordinate Plane

Coordinate Plane

y

x
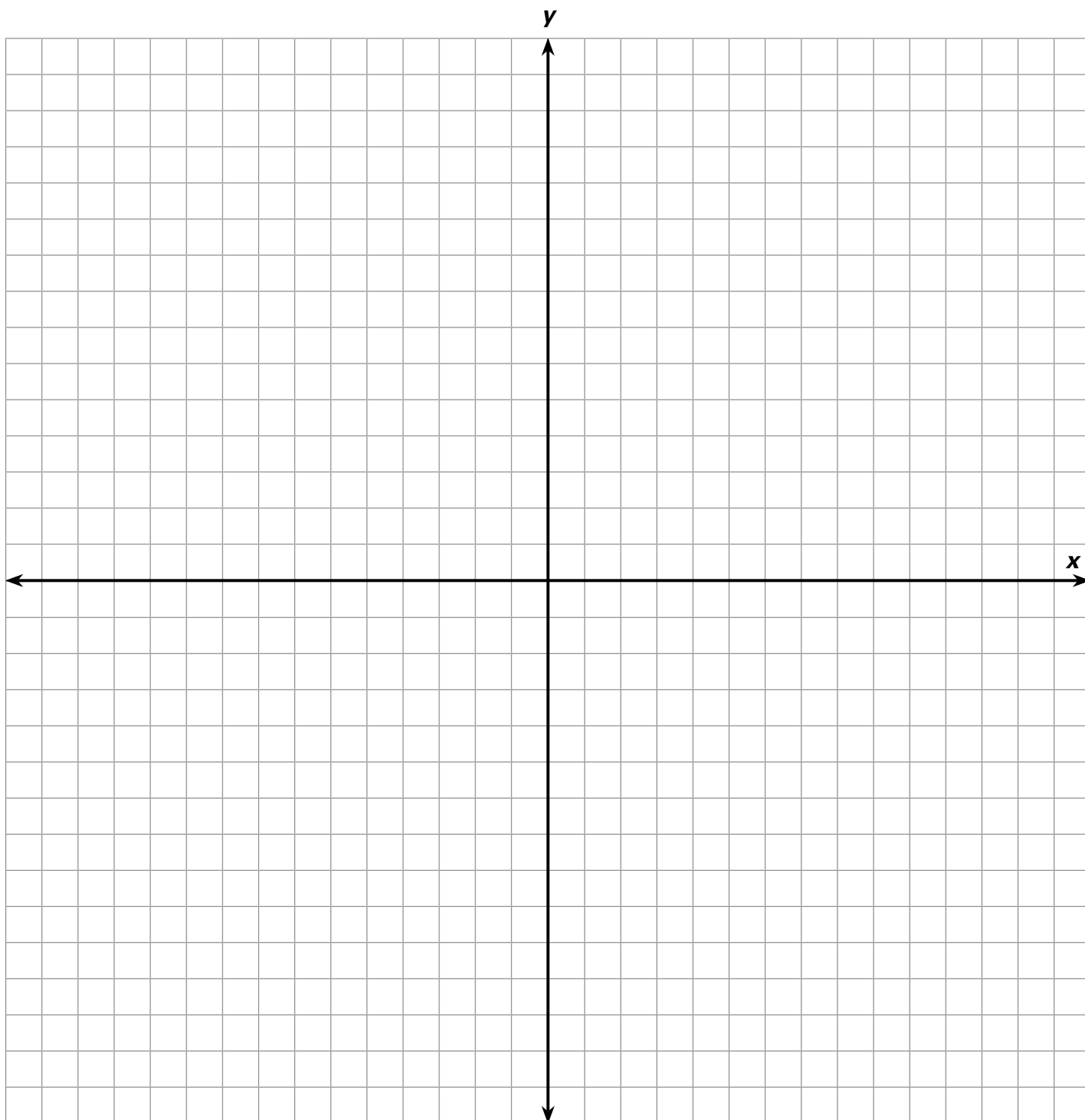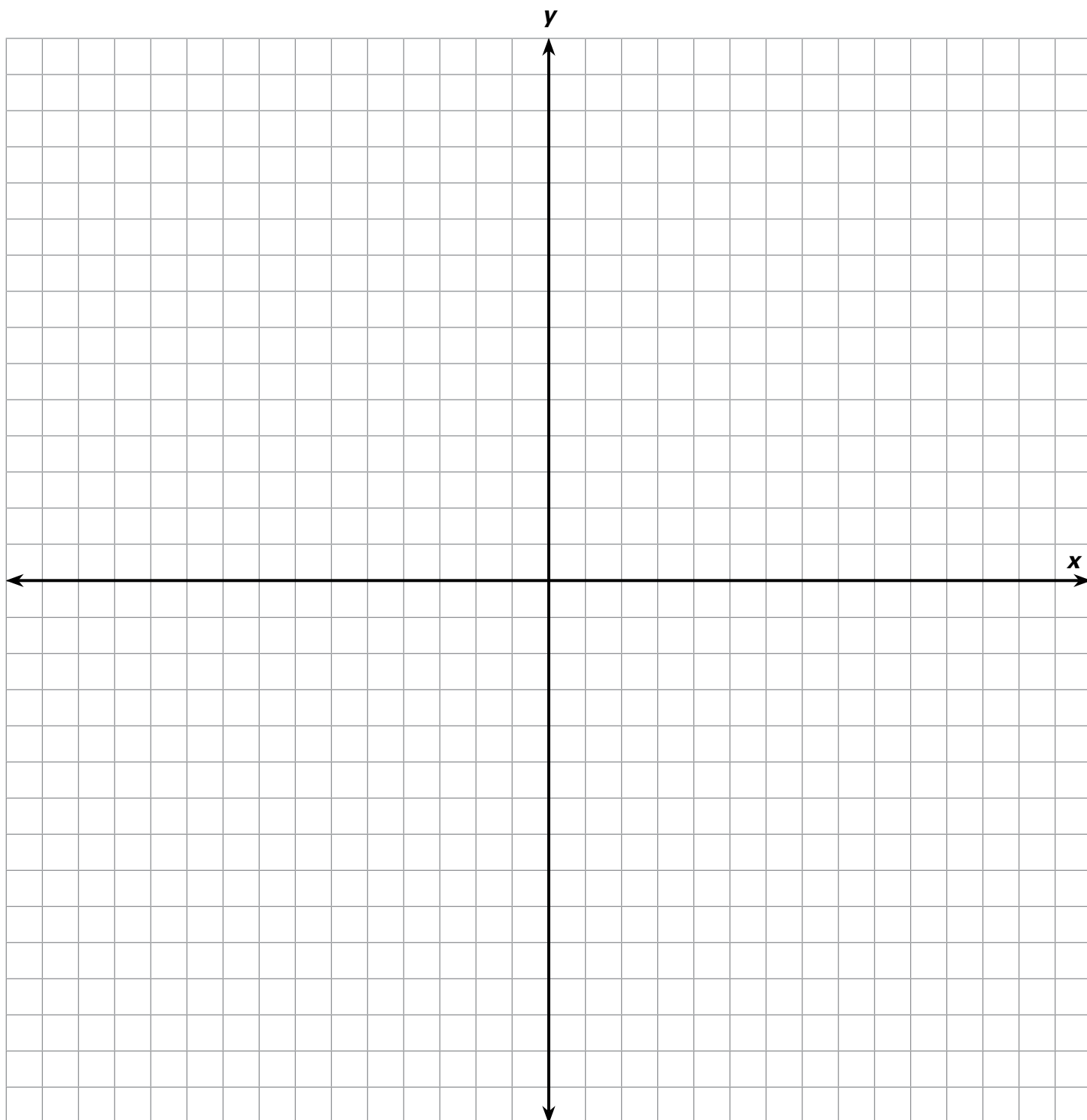
Bowling Price Per Game

Games Played (x)	Total Cost for Games (y)
0	0
1	2
2	4
3	6
4	8

Total Bowling Cost

(x)	(y)

y-axis: Cost ($), marked 0, 2, 4, 6, 8, 10, 12, 14, 16
x-axis: Games played, marked 1, 2, 3, 4, 5
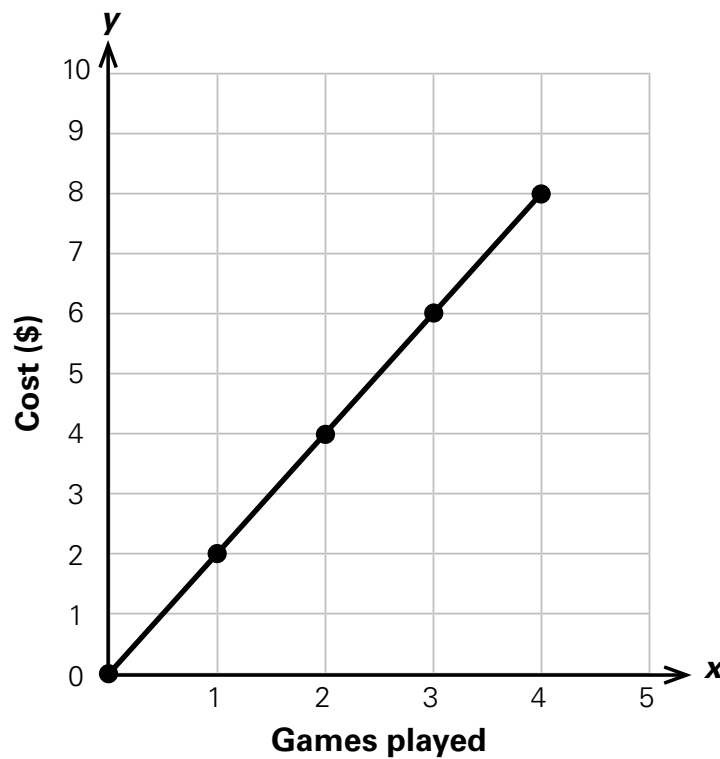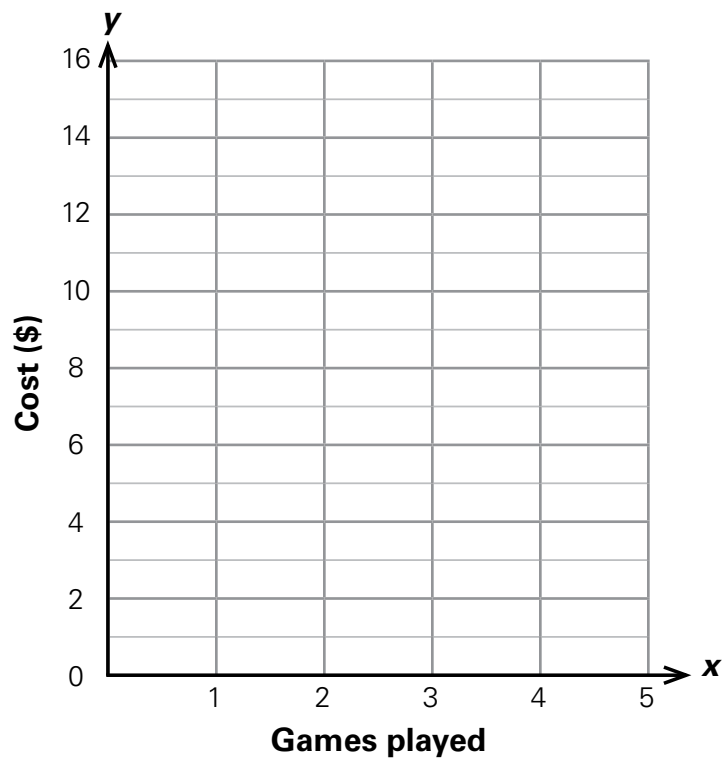
Triangle Time

Part 1: Use a right triangle to identify the slope of each graph. Use a similar right triangle to verify.
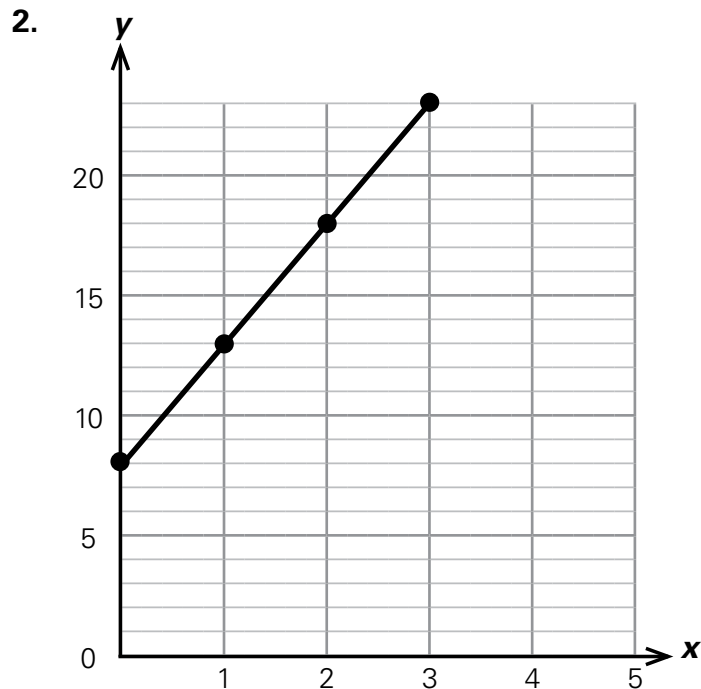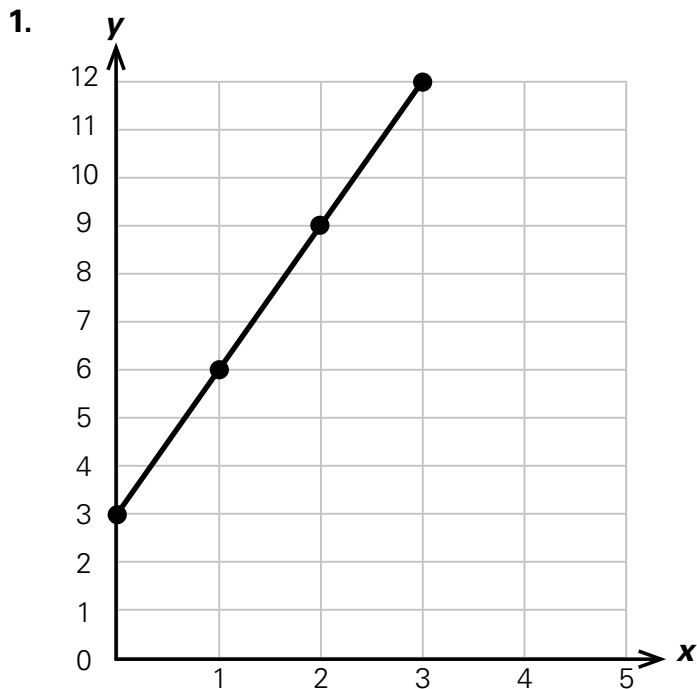
1.

What is the slope of the graph? _____

2.

What is the slope of the graph? _____

3.

What is the slope of the graph? _____

4.
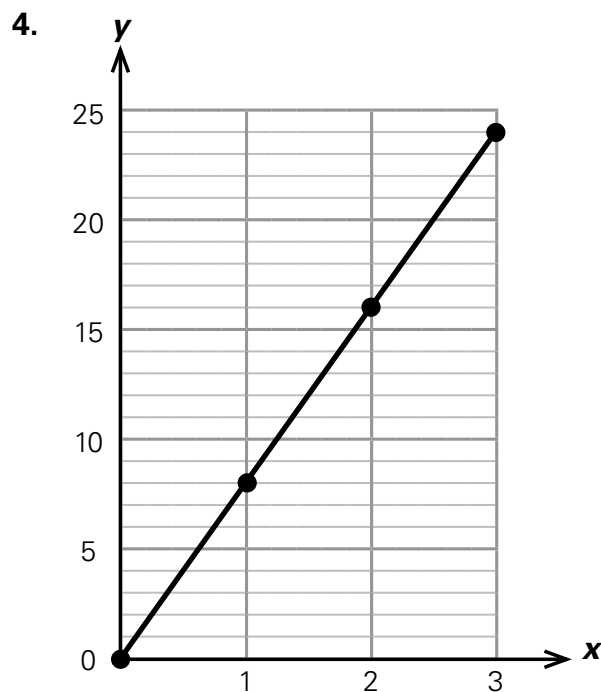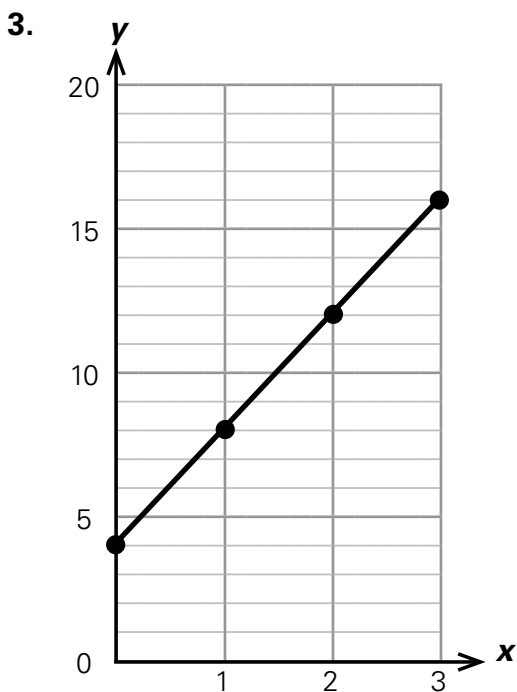
What is the slope of the graph? _____

More Triangles

Review the example problem. Then plot the ordered pairs on **coordinate planes** and draw a line. Use right triangles to identify the slope of linear, non-proportional graphs.

Example

What is the slope of the graph with the points (0, 1), (1, 5), (2, 9), and (3, 13)?

Step 1

Plot the points and create the graph.
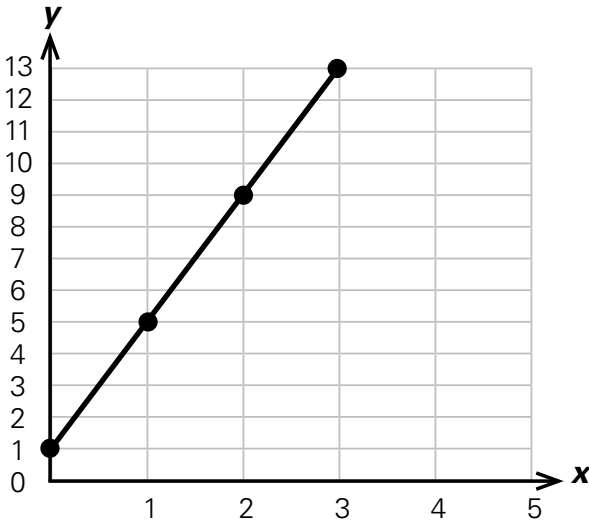
Step 2

Draw a right triangle using any points on the line to show the change in the *y*- and *x*-values between points.
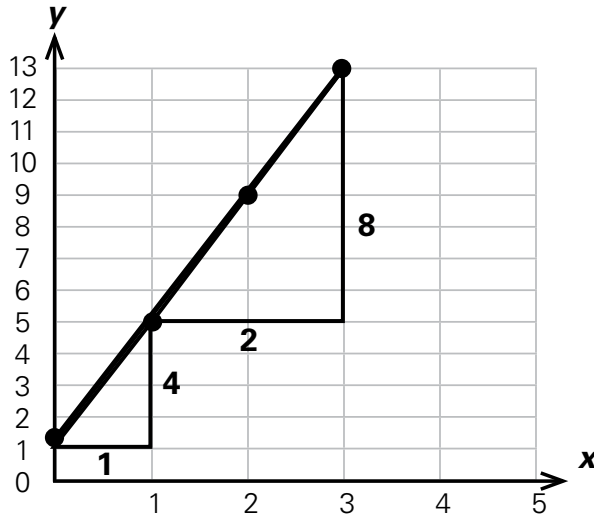
The triangles shown are possibilities. One triangle uses (0, 1) and (1, 5). The other uses (1, 5) and (3, 13).

Step 3

Express the slope as a ratio of the change in *y* over the change in *x*.

Ratio: ⁴⁄₁ or ⁸⁄₂   Slope = 4

---

1. Graph (0, 2), (1, 7), and (2, 12).

What is the ratio of change in *y* to change in *x*? _____

What is the slope? _____

2. Graph (0, 1), (1, 8), and (2, 15).

What is the ratio of change in *y* to change in *x*? _____

What is the slope? _____

3. Graph (0, 7), (1, 9), (2, 11), and (3, 13).

What is the ratio of change in *y* to change in *x*? _____

What is the slope? _____

4. Graph (0, 5), (1, 6), (2, 7), and (3, 8).

What is the ratio of change in *y* to change in *x*? _____

What is the slope? _____

Catapult Learning™

Lesson 31 Exit Ticket

Draw right triangles on each graph below to identify the slope. Fill in the blanks.
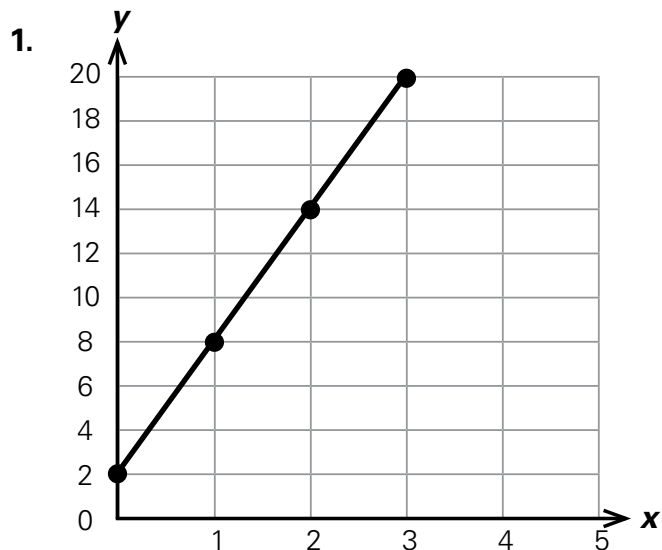
1.

What is the slope of the graph as a ratio of change in y to change in x? _____

What is the slope of the graph as a whole number? _____

2.
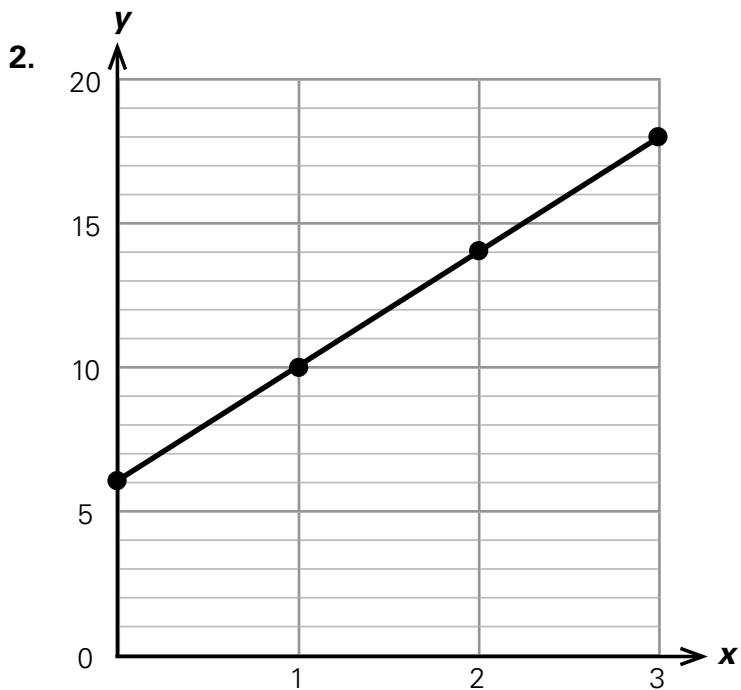
What is the slope of the graph as a ratio of change in y to change in x? _____

What is the slope of the graph as a whole number? _____

Extra Practice: Triangles and Slopes

Part 1: Use the graph to answer the questions.

1. Theresa said the slope of the graph shown is 8. Use right triangles to check Theresa's work. If she's wrong, identify the correct slope.

What is the slope for Theresa's graph?

_____
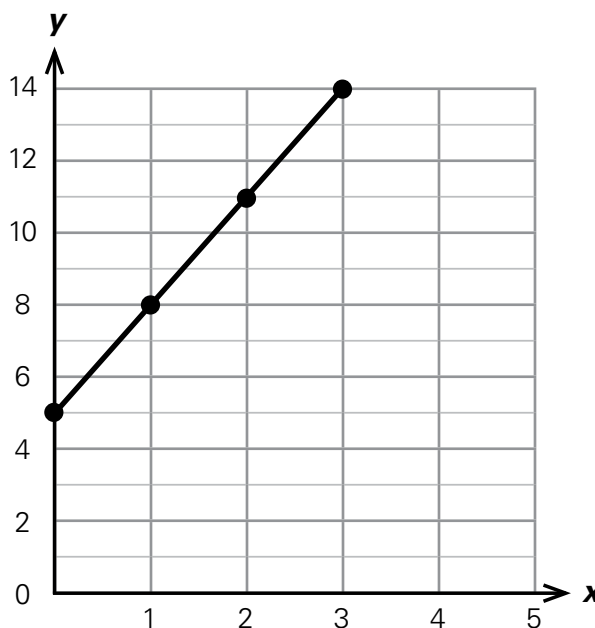
Part 2: Determine whether the following statements are *true* or *false*.

2. You can always find the slope of a linear, non-proportional graph by using the *y*-value when $x = 1$.

_____

3. The right triangle procedure for finding the slope of a graph does not work for graphs of proportional relationships. _____

4. The slope of a linear relationship is the ratio of the change in *y*-value to the change in *x*-value.

_____

5. To find the slope of a linear, non-proportional graph, draw a right triangle from the origin to the first point on the line. _____

6. A non-proportional linear graph does not go through the origin. _____

Ms. Falconer's Graphs

Graph 1
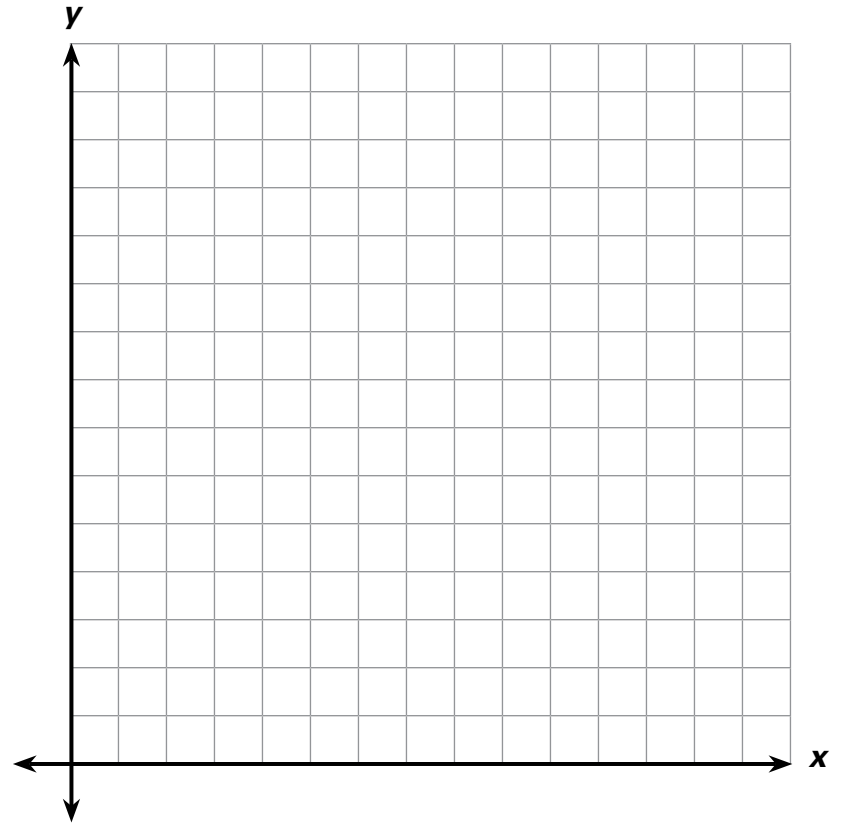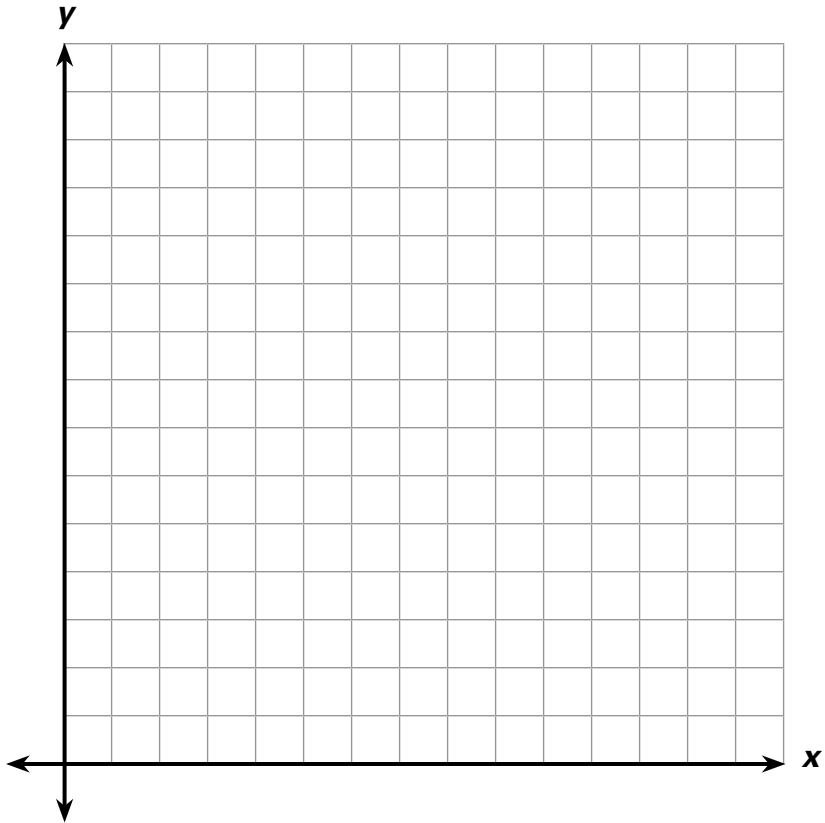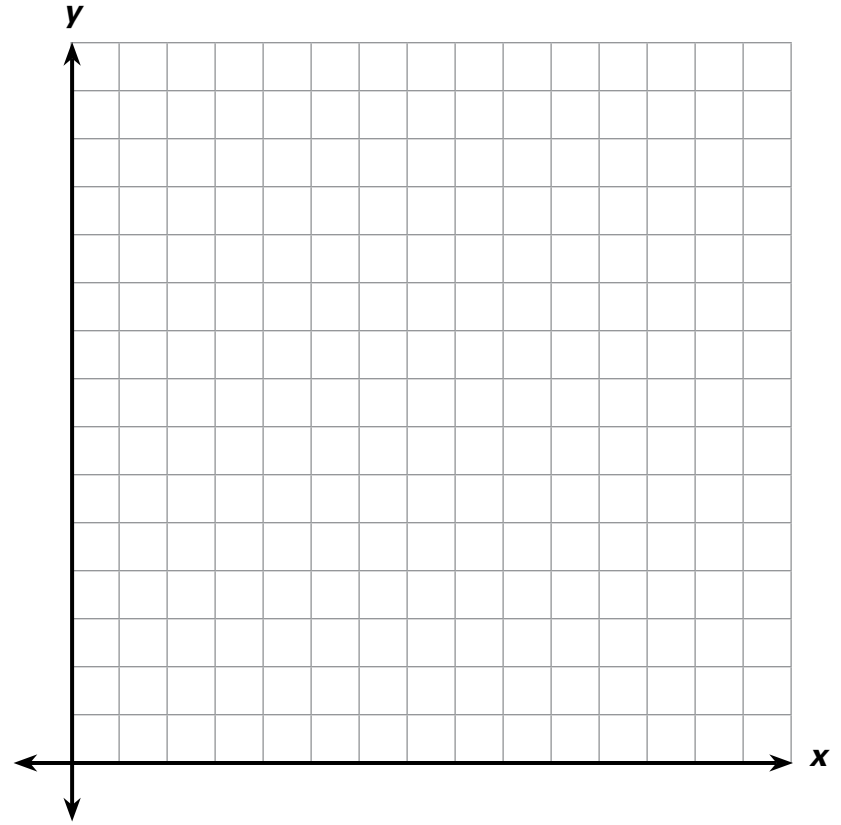

Graph 2

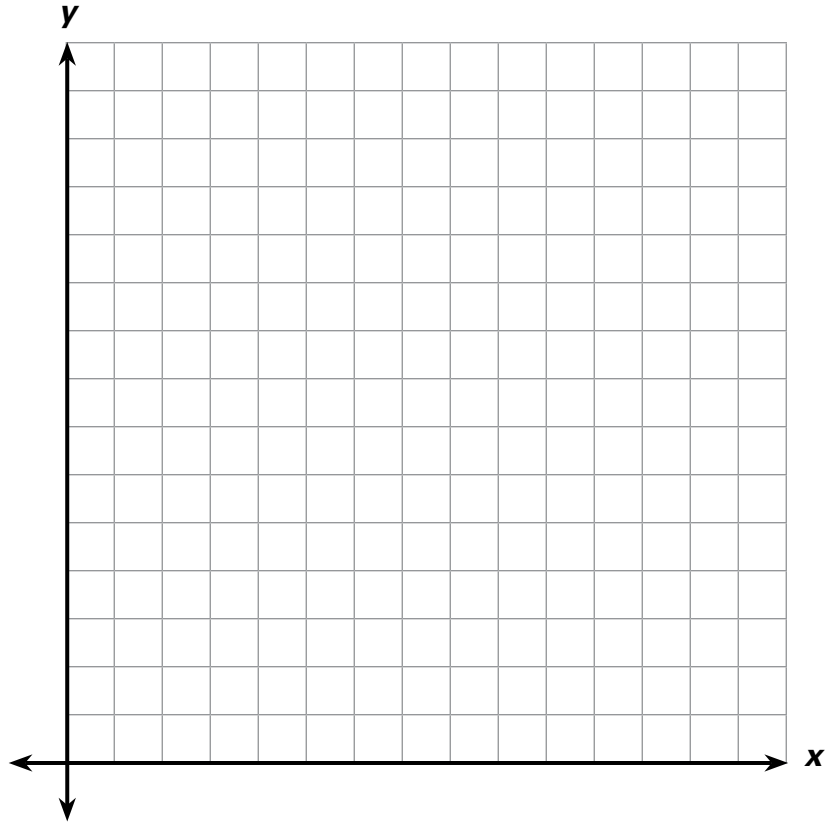# Find the Slope

©2021
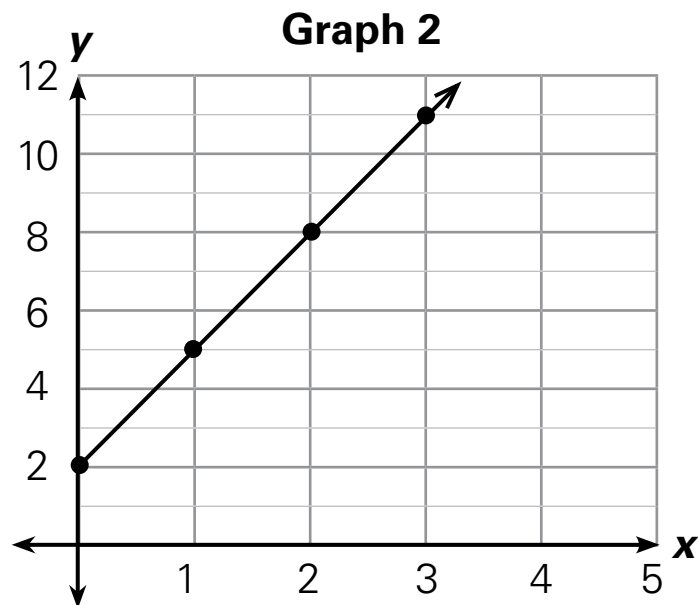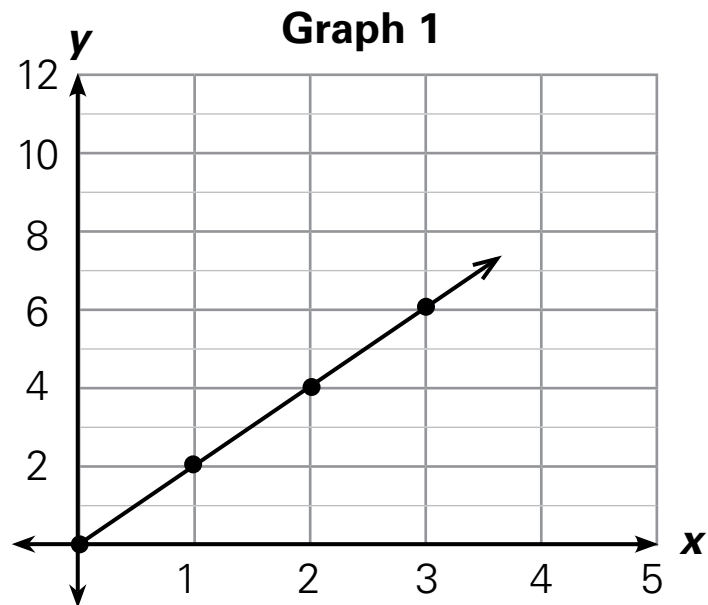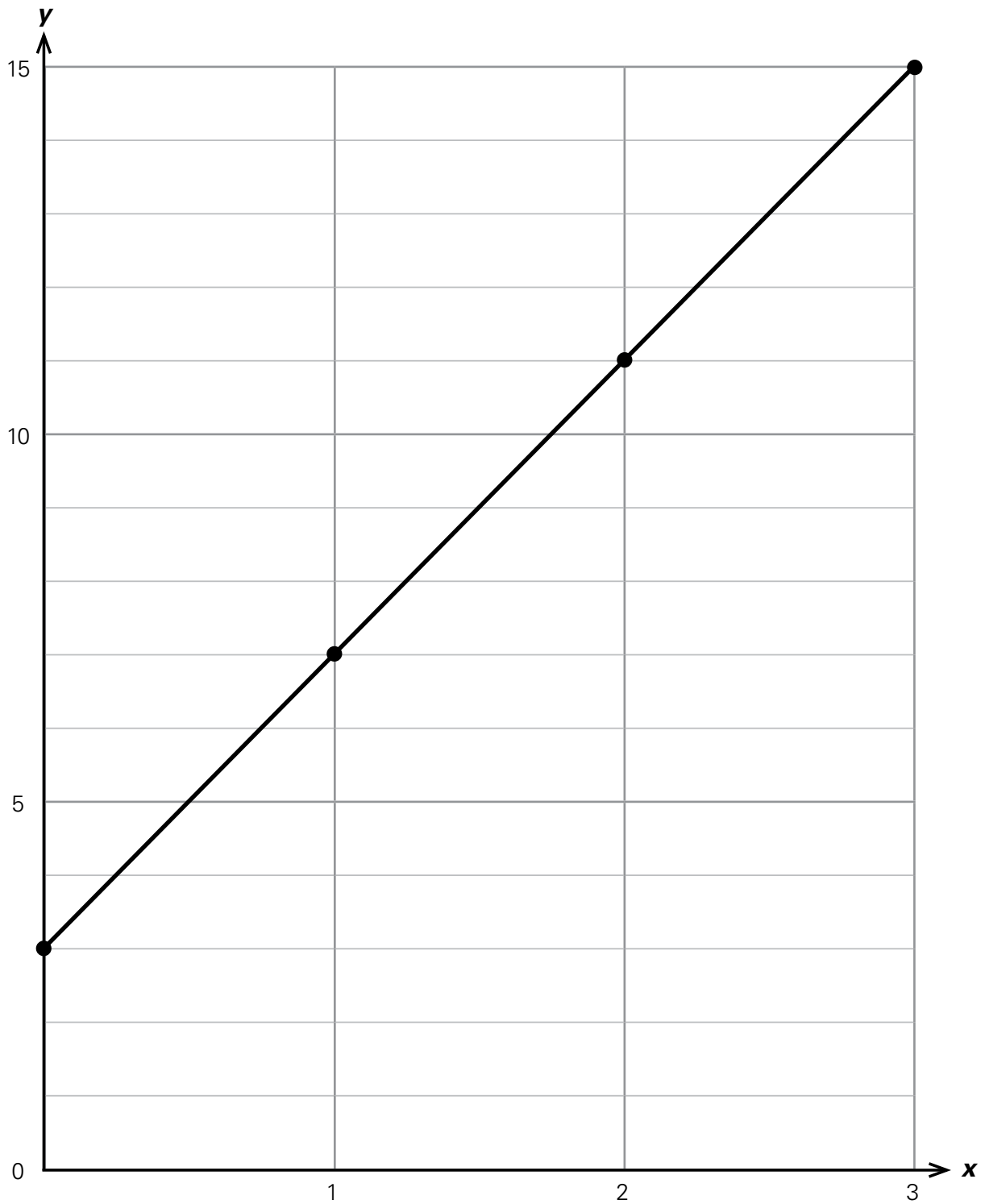
Fast Check

Coordinate Planes (First Quadrant)
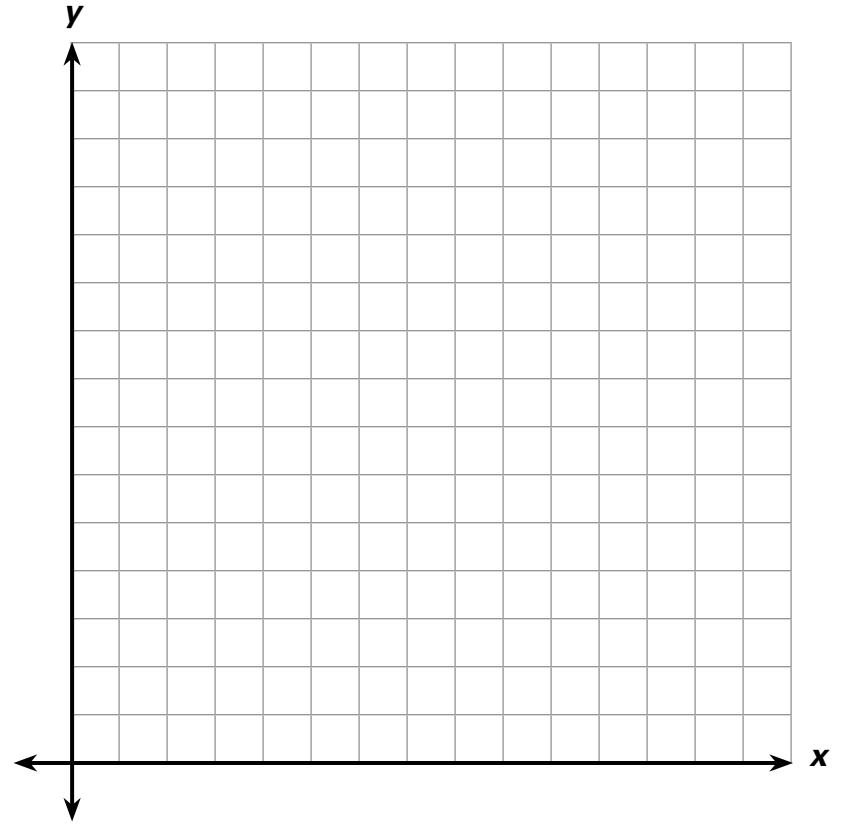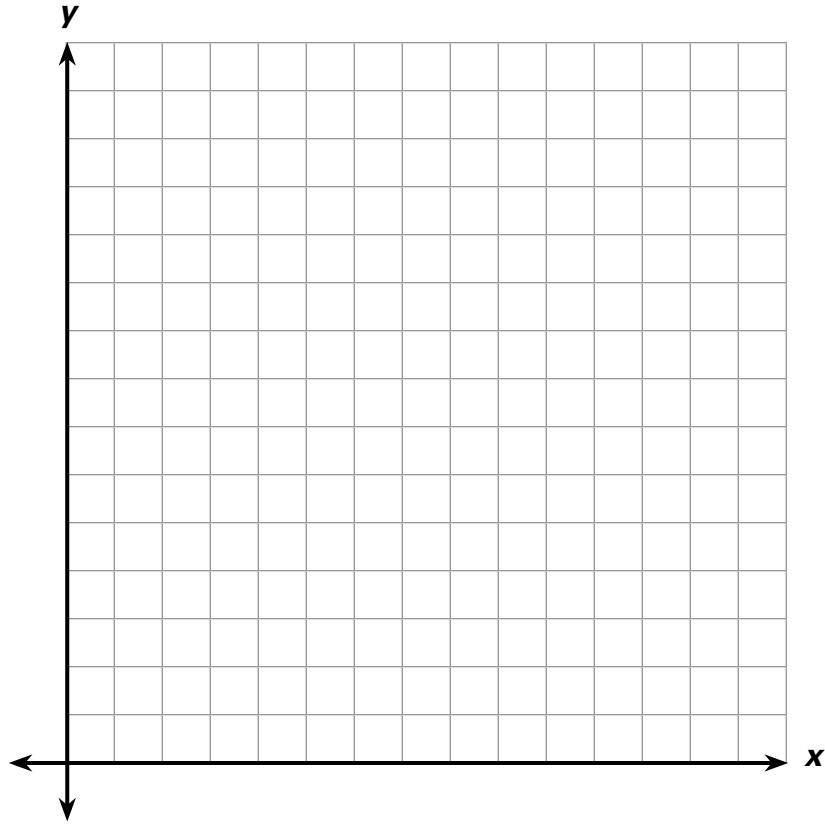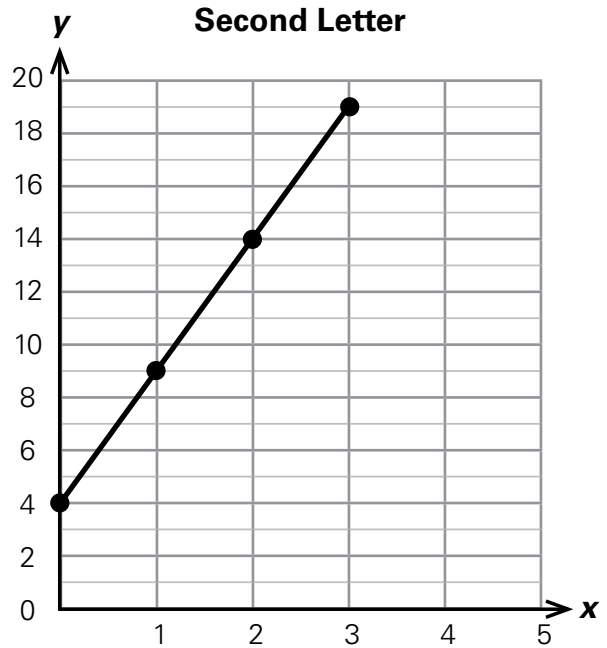
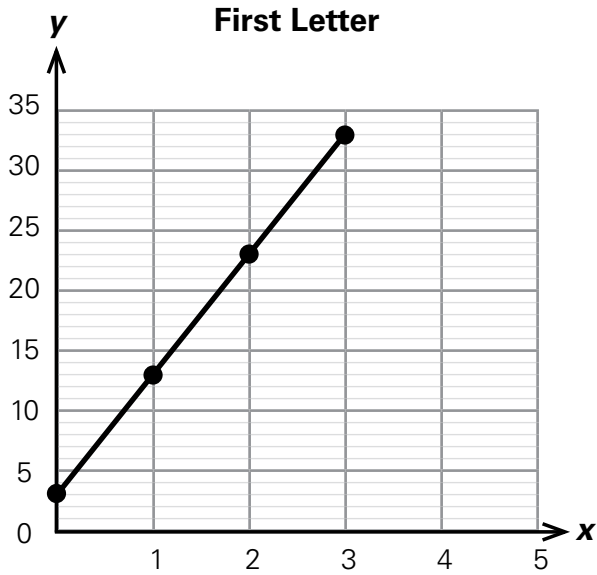# Coordinate Planes (First Quadrant)

Coordinate Planes (First Quadrant)

Locker Combo

Connor can't remember the combination for his locker, but he knows it has something to do with flying. The slopes of the three graphs shown give the three letters that make up the combination. Help Connor figure out his locker combination.

First Letter

Second Letter

Code Key

A	1	**N**	14
B	2	**O**	15
C	3	**P**	16
D	4	**Q**	17
E	5	**R**	18
F	6	**S**	19
G	7	**T**	20
H	8	**U**	21
I	9	**V**	22
J	10	**W**	23
K	11	**X**	24
L	12	**Y**	25
M	13	**Z**	26

Third Letter
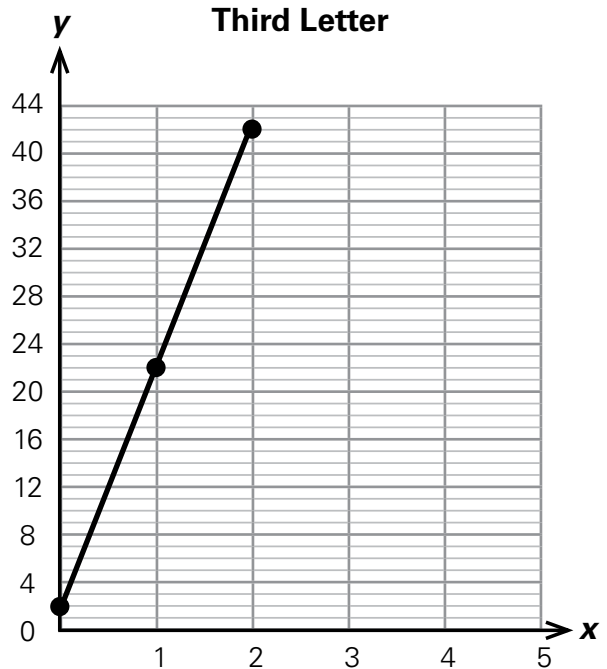
Locker Combination

_____ _____ _____

Book Donations

Use the given data table or graph to identify two points in a linear relationship and use these to find the slope. Then answer the questions.

1. Anwar's friend Naomi is also donating books to the used book sale. Like Anwar, she puts the same number of books in a pile each day and will donate the entire pile the day before the book sale. The table shows Naomi's book pile count on different days.
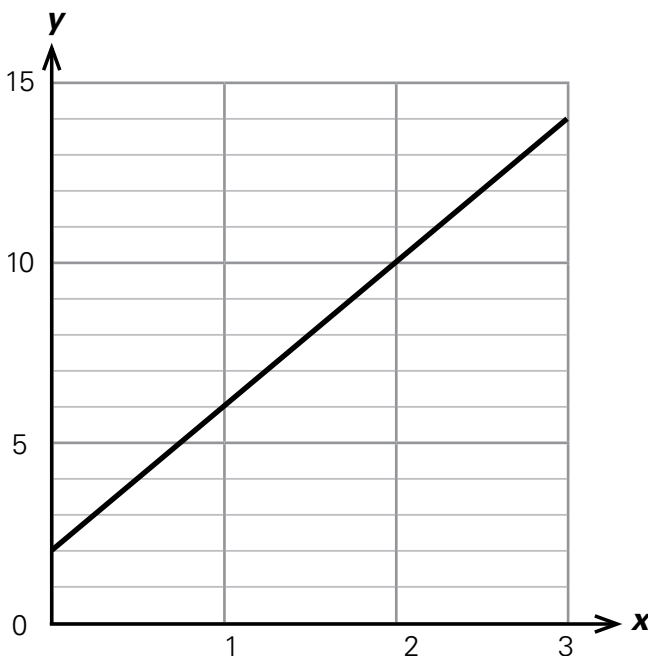
Day (x)	Naomi's Book Pile Count (y)
5	66
6	78
7	90
8	102
9	114

   a. How can you use this data table to find the slope—the number of books Naomi puts in her pile each day? _____

_____

_____

_____

   b. Solve for the slope. Show your work.

   c. Naomi put how many books in her pile each day? _____ books

2. What is the slope of the line? Choose two points and use the slope formula.

Slope: _____

Slippery Slopes

Review the example problem. Then use the slope formula to identify the slope of a linear relationship. Find the slope for each set of ordered pairs. Show your work.

Example

What is the slope of the linear relationship containing the points (**3, 80**) and (**10, 248**)?

Step 1

Choose a coordinate pair with lesser values (x_1, y_1) and a coordinate pair with greater values (x_2, y_2).

$(x_1, y_1) = ($**3, 80**$)$
$(x_2, y_2) = ($**10, 248**$)$

Step 2

Use the slope formula.

$$\frac{y_2 - y_1}{x_2 - x_1}$$

Step 3

Substitute values and solve for the slope.

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{\mathbf{248 - 80}}{\mathbf{10 - 3}} = \frac{168}{7} = 24$$

The slope is **24**.

---

1. (11, 331) and (20, 592)

Slope: _____

2. (3, 208) and (10, 243)

Slope: _____

3. (3, 105) and (15, 525)

Slope: _____

4. (27, 292) and (46, 387)

Slope: _____

5. (8, 151) and (19, 349)

Slope: _____

6. (23, 197) and (34, 285)

Slope: _____

7. (2, 118) and (24, 1,394)

Slope: _____

8. (22, 155) and (42, 435)

Slope: _____

9. (10, 170) and (22, 374)

Slope: _____

10. (52, 22) and (58, 40)

Slope: _____

Catapult Learning™

Lesson 32 Exit Ticket

Part 1: Ben is keeping track of his nightly reading. He reads the same number of pages each night. The data table shows the total number of pages read after different numbers of nights.

Nights (x)	Total Number of Pages (y)
6	110
10	182
16	290
22	398

1. What are two ordered pairs in the table that represent this situation? _____

2. Use the two ordered pairs from the data table to find the slope using the slope formula. Show your work.

   The slope of the line is _____.

Part 2: Use the graph to answer the questions.
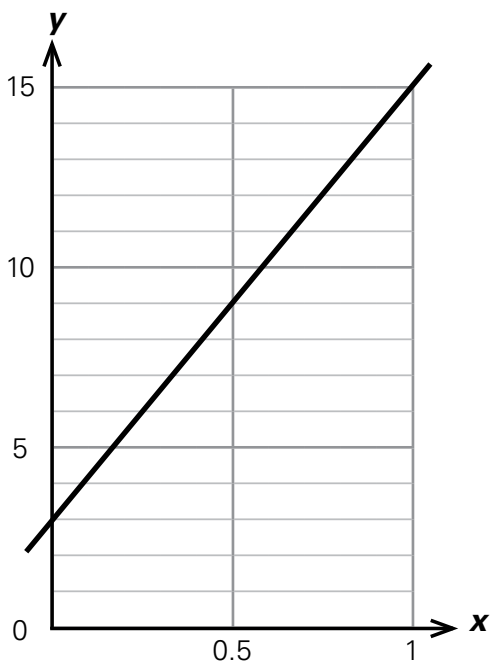
3. What are two points on the line? Plot and label the points on the graph.

4. What is the slope of the line? Use the two points and the slope formula. Show your work.

   Slope: _____

Extra Practice: For the Win

Part 1: Match the ordered pairs with the correct slope.

(2, 46) and (6, 138)	16
(9, 151) and (12, 193)	39
(8, 128) and (22, 352)	14
(7, 279) and (15, 591)	23
(6, 288) and (10, 480)	48

Part 2: Use the slope formula and answer the questions.

1. Helena and Victor compete about EVERYTHING. Helena is the fastest runner on the girls' track team, and Victor is fastest on the boys' team, but they run different events. They are going to use their best times on their best events to figure out who is faster for average rates. The tables show their best times for the events they run.

    Victor

Seconds	Meters
70	400
310	1600

    Helena

Seconds	Meters
13	100
153	800

    a. Write two ordered pairs for each student from the data table.

    Victor: _____

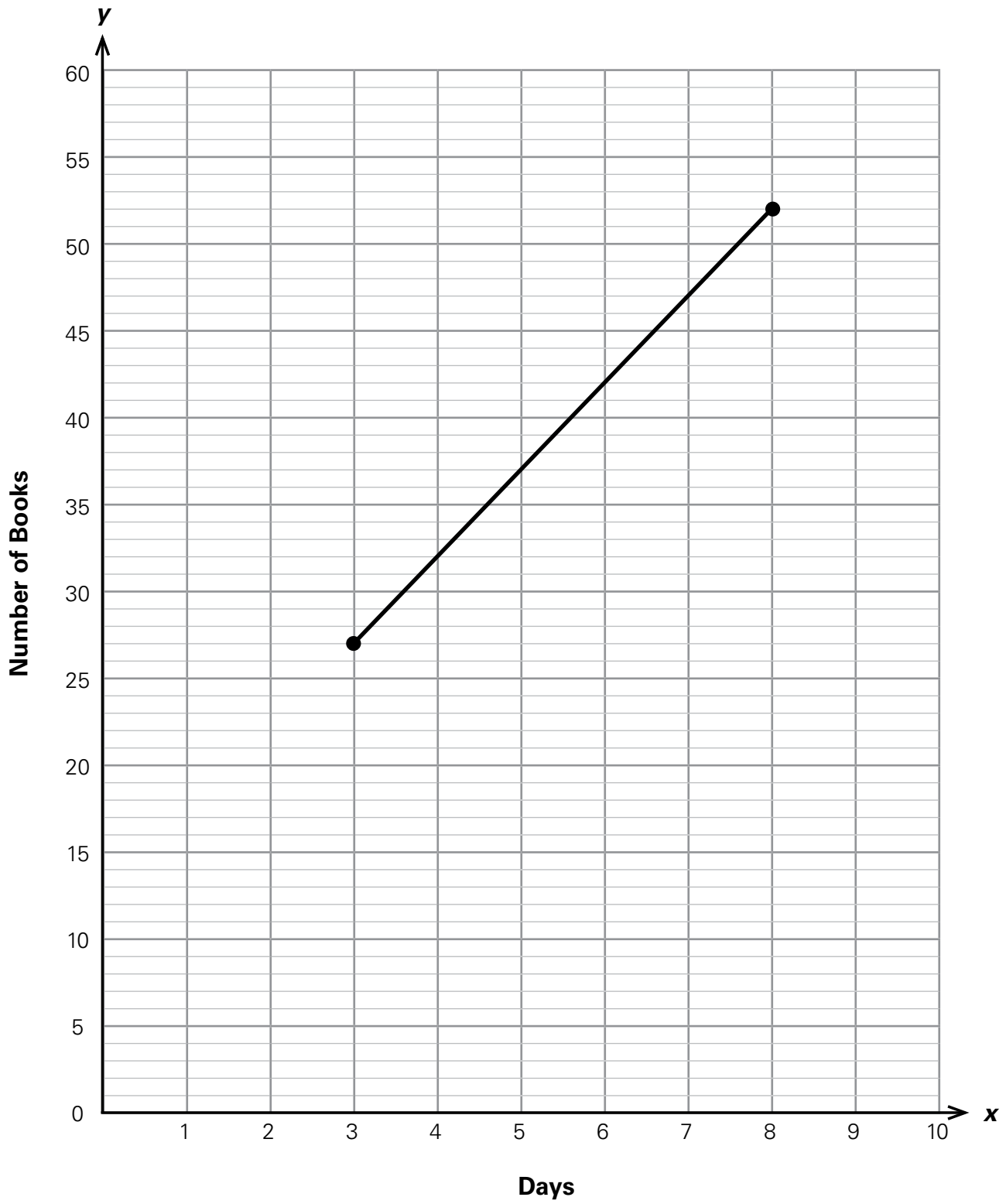   Helena: _____

    b. Write and solve the slope formula for each student. Show your work.

    Victor:

    Helena:

    c. Who wins? Explain. _____

Anwar's Book Donation Graph

Slope Race

(4, 236) and (12, 708)

(3, 44) and (8, 109)

(9, 243) and (15, 405)

(11, 139) and (21, 229)

(6, 136) and (14, 312)

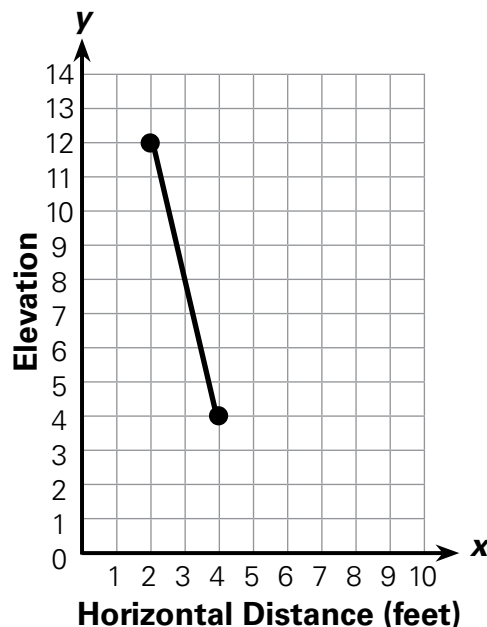(7, 126) and (17, 306)

(2, 39) and (9, 116)

(8, 112) and (12, 168)

(5, 93) and (28, 484)

(4, 101) and (15, 365)

Snow Sledding

Use the graph and ratio tables to answer the questions.

1. Oscar went sledding on a new hill with his friends. The graph shows two points along the hillside where Oscar went sledding.

a. Predict whether this slope will be positive or negative.

Explain how you know. _____

_____

_____

_____

_____

b. Use the slope formula with the coordinate pairs (2, 12) and (4, 4) to find the slope.

The slope of the hill where Oscar went sledding is _____.

2. This data table shows a linear relationship.

a. Do you predict the data in this table would have a negative or positive

slope? Why? _____

_____

b. Use the slope formula with the coordinate pairs (1, 9) and (2, 5) to find the slope.

Slope: _____

x	y
0	13
1	9
2	5

3. This data table shows a linear relationship. Use the slope formula to find the slope.

Slope: _____

x	y
0	10
1	8
2	6

Positive and Negative Slopes

Review the example problem. Then use the ordered pairs and the slope formula to find the slope of each linear relationship. Show your work.

Example

What is the slope of the linear relationship represented by the coordinates?

(**3, 315**) and (**8, 240**)

Step 1

Use either coordinate pair as (x_1, y_1) and use the other pair as (x_2, y_2)

$(\mathbf{3, 315}) = (x_1, y_1)$

$(\mathbf{8, 240}) = (x_2, y_2)$

Step 2

Substitute values in the slope formula and solve for the slope.

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{\mathbf{240 - 315}}{\mathbf{8 - 3}} = \frac{-75}{5} = -15$$

The slope is -15.

1. Ordered pairs: (1, 7) and (4, 1).

Slope: _____

2. Ordered pairs: (5, 6) and (6, 2).

Slope: _____

3. Ordered pairs: (2, 22) and (5, 34).

Slope: _____

4. Ordered pairs: (3, 2) and (8, 12).

Slope: _____

5. Ordered pairs: (1, 17) and (2, 8).

Slope: _____

6. Ordered pairs: (0, 10) and (4, 2).

Slope: _____

7. Ordered pairs: (2, 54) and (6, 90).

Slope: _____

**8.** Ordered pairs: (3, 10) and (8, 15).

Slope: _____

Lesson 33 Exit Ticket

Part 1: Georgia is trying to find the slope of the line in the graph shown. Use the graph to answer the questions.

1. Predict whether the slope will be negative or positive. Explain. _____

_____

_____

2. What are the coordinate pairs of the two points shown in the graph?

_____

3. Solve for the slope of this relationship using the slope formula. Show your work.
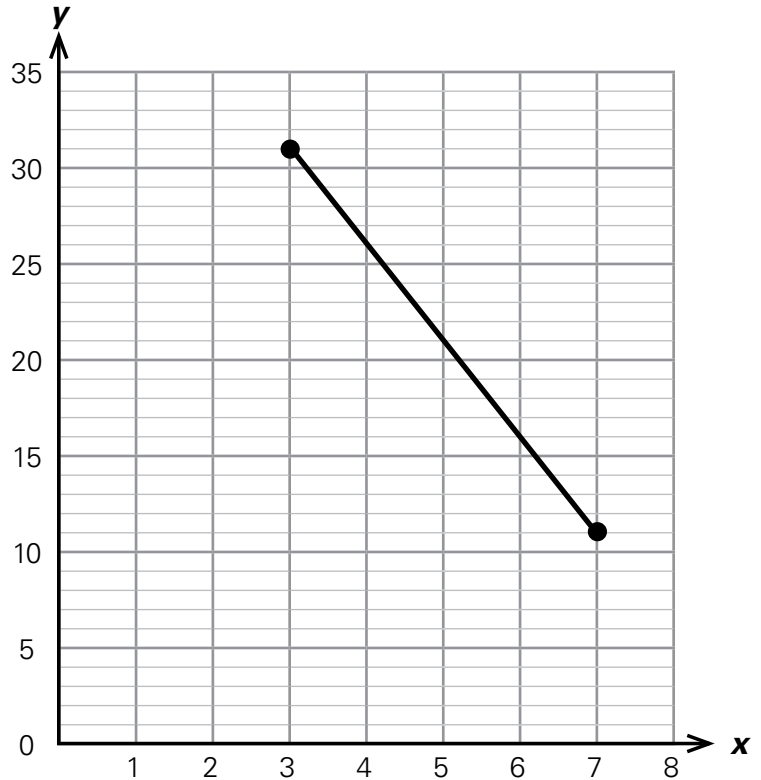
The slope of the line in Georgia's graph is _____.

Part 2: This ratio table shows a linear relationship. Use the table to answer the questions.

4. Do you predict the data in this table would have a negative or positive slope?

Why? _____

_____

x	y
0	58
2	42
5	18

5. Solve for the slope of this relationship using the slope formula.
Show your work.

Slope: _____

Extra Practice: More Slopes

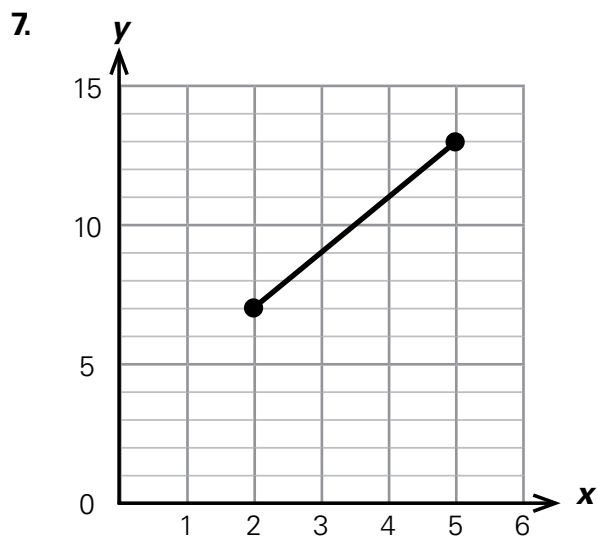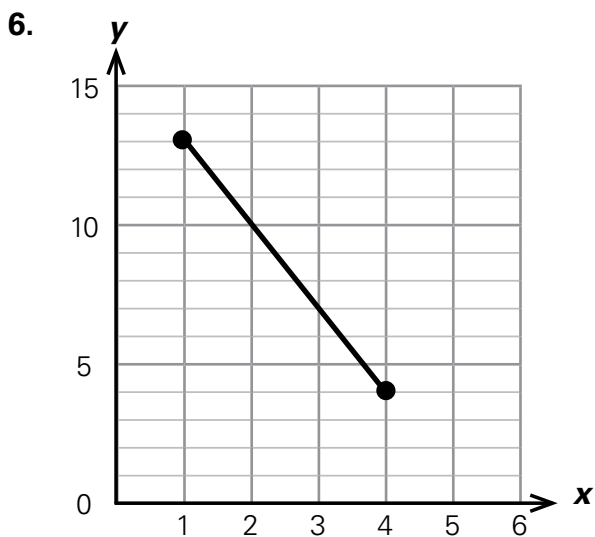**Part 1:** Find the slope for each set of ordered pairs.

1. (3, 37) and (6, 16) _____

2. (1, 82) and (4, 43) _____

3. (2, 34) and (5, 16) _____

4. (4, 64) and (9, 19) _____

5. (2, 11) and (7, 1) _____

Part 2: Decide which graph has a positive slope and which has a negative slope.

6.

_____

7.

_____

8. Circle the ordered pairs that have a positive slope and draw a rectangle around the ordered pairs that have a negative slope.

(2, 36) and (4, 12)

(1, 36) and (4, 92)

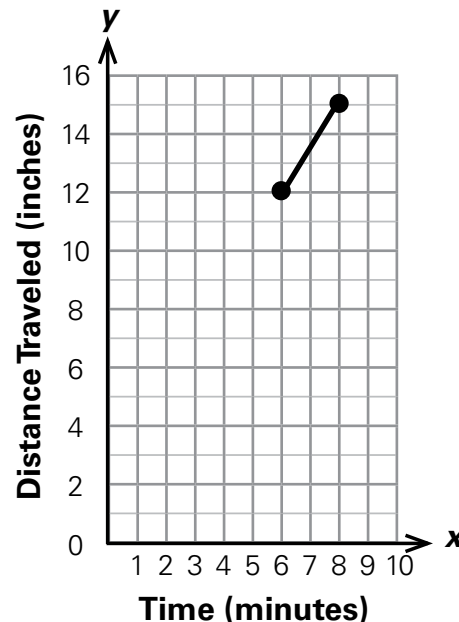(3, 23) and (7, 43)

(1, 23) and (6, 3)

(3, 39) and (5, 23)

(2, 65) and (5, 161)

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Speeds of Slow Things

Read the problem, then use the graph to answer the questions.

1. Eden likes to race snails. The graph shows the distance from the starting line her snail Speedy was at two points in time—partway through the race and at the end. Speedy got a bit of a head start because he's so small.
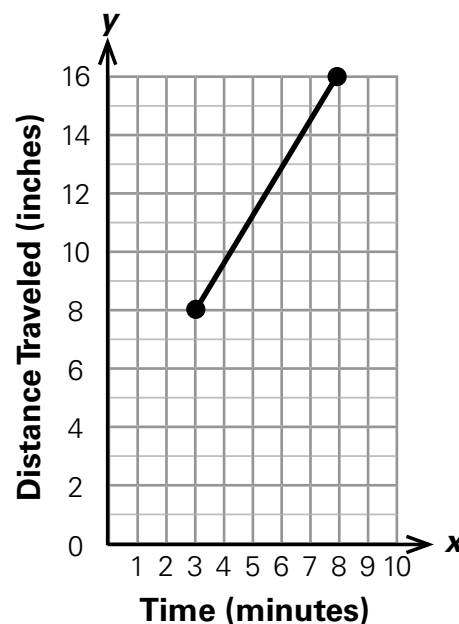
   a. Will this graph have a positive or negative slope? Explain.

   _____

   _____

   b. Use the slope formula to find the slope.

   The slope of the line is _____ as a fraction or _____ as a decimal number.

   c. What does the slope represent in this situation? _____

   _____

2. Another snail, The Champ, was big for her racing division, and so the judges had her start after the other snails began the race. The graph shows two points in time where The Champ was partway through the race, and at the end.

   a. Will this graph have a positive or negative slope? Explain.

   _____

   _____

   b. Use the slope formula to find the slope.

   The slope of the line is _____ as a fraction or _____ as a decimal number.

   c. What does the slope represent in this situation? _____

   _____

Drain and Fill

Review the example problem. Then read the scenarios and graph the two points on graph paper. Use your graph to answer the questions.

Example

Eden is draining a fish tank before giving it to a friend who just got some fish. The graph shows the rate the water is draining. A line has the points **(6, 13)** and **(18, 7)**. What is the slope of the graph?
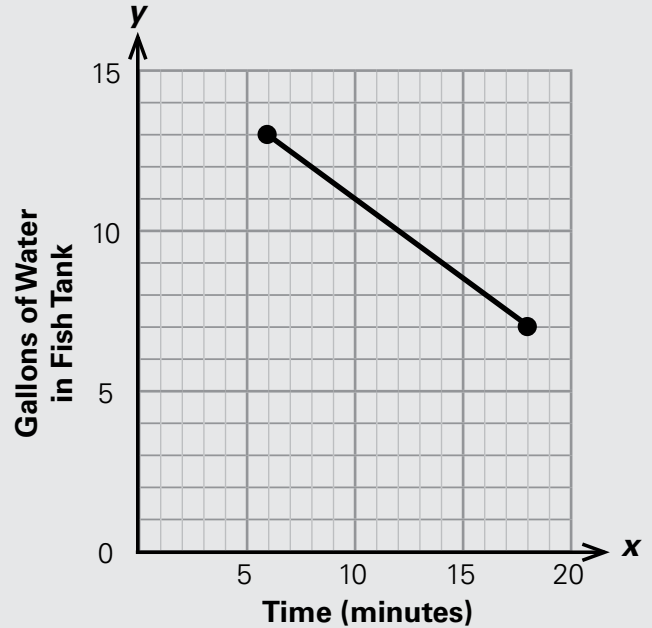
Step 1

Use either coordinate pair as (x_1, y_1) and (x_2, y_2). Substitute values in the slope formula and solve.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7 - 13}{18 - 6} = \frac{-6}{12} = \frac{-1}{2}$$

Step 2

Interpret the meaning of the slope.

The slope is $-\frac{1}{2}$.

It represents $-\frac{1}{2}$ gallon per minute, the rate of the fish tank draining.

1. Eden's bathtub clogged. After 9 minutes, 27 gallons remained in the tub. After 18 minutes, 23 gallons remained in the tub.
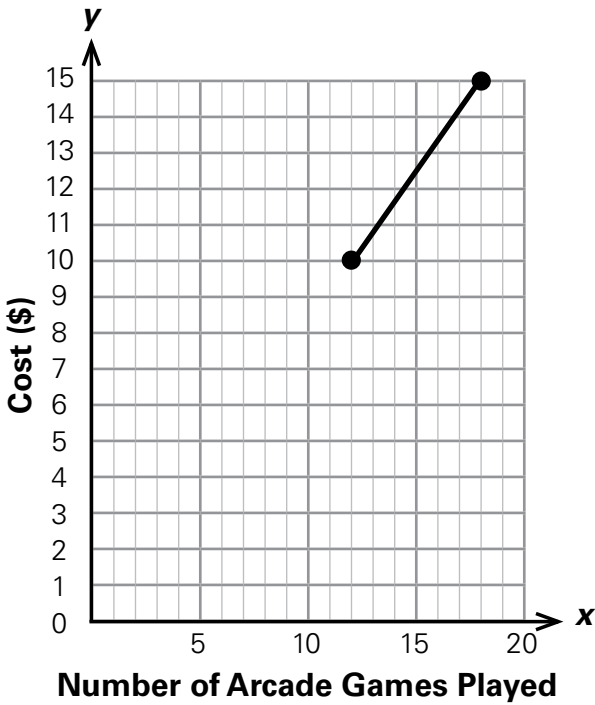
   a. The slope of the line is _____.

   b. What does the slope represent in this situation? _____

   _____

2. Eden is filling up pool for her pet turtle. After 5 minutes, 108 gallons filled the pool. After 10 minutes, 150 gallons filled the pool.

   a. The slope of the line is _____.

   b. What does the slope represent in this situation? _____

   _____

Catapult Learning™

Lesson 34 Exit Ticket

Part 1: Use the graph and the slope formula to find the slope of the line.

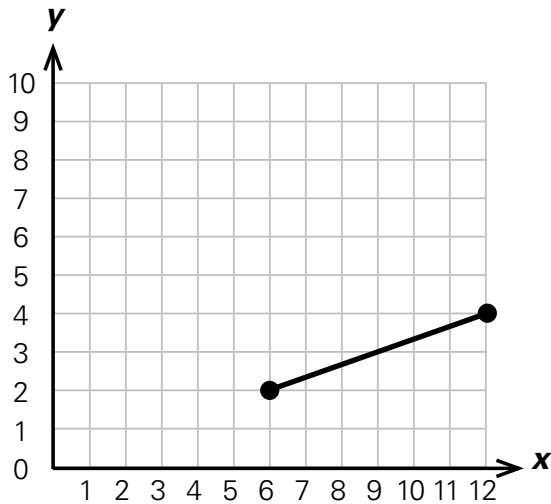**Cost ($)**

Number of Arcade Games Played

1. Solve for the slope of this relationship using the slope formula. Show your work.
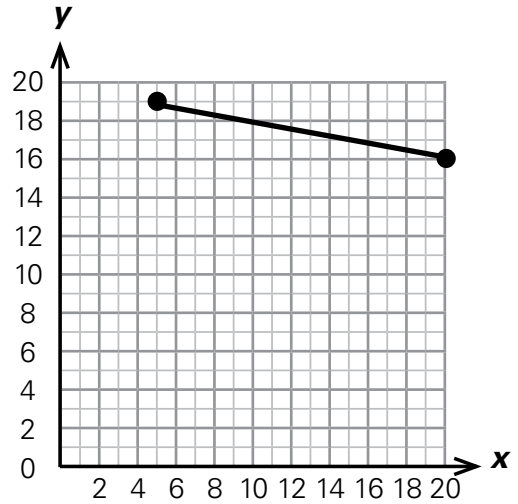
   The slope of the line in the graph is _____.

2. What does the slope represent in this situation?

   _____

   _____

Part 2: Decide which graph has a positive slope and which has a negative slope.
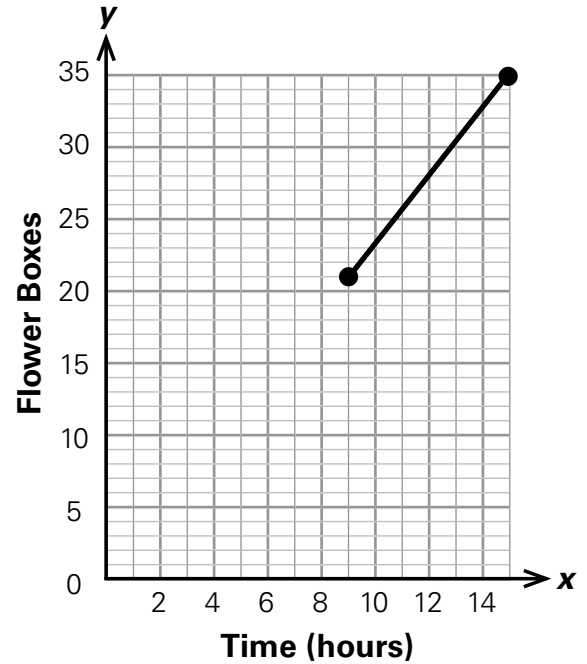
3.

4.

_____   _____

Extra Practice: Flower Boxes

Part 1: Use the slope formula to identify a slope and solve a real-world problem.

The graph shows the time it takes for Sante to build his flower boxes on Tuesday. Some flower boxes were already built.

1. Sante said the slope of this line is $\frac{3}{7}$. Is Sante correct? Solve for the slope of this relationship using the slope formula to verify your answer. Show your work.

_____

_____

2. What does the slope represent in this situation?

_____

Part 2: Find the slope for each set of ordered pairs.

3. (25, 11) and (60, 25)   _____

4. (8, 7) and (24, 3)   _____

5. (45, 25) and (63, 35)   _____

6. (18, 49) and (36, 16)   _____
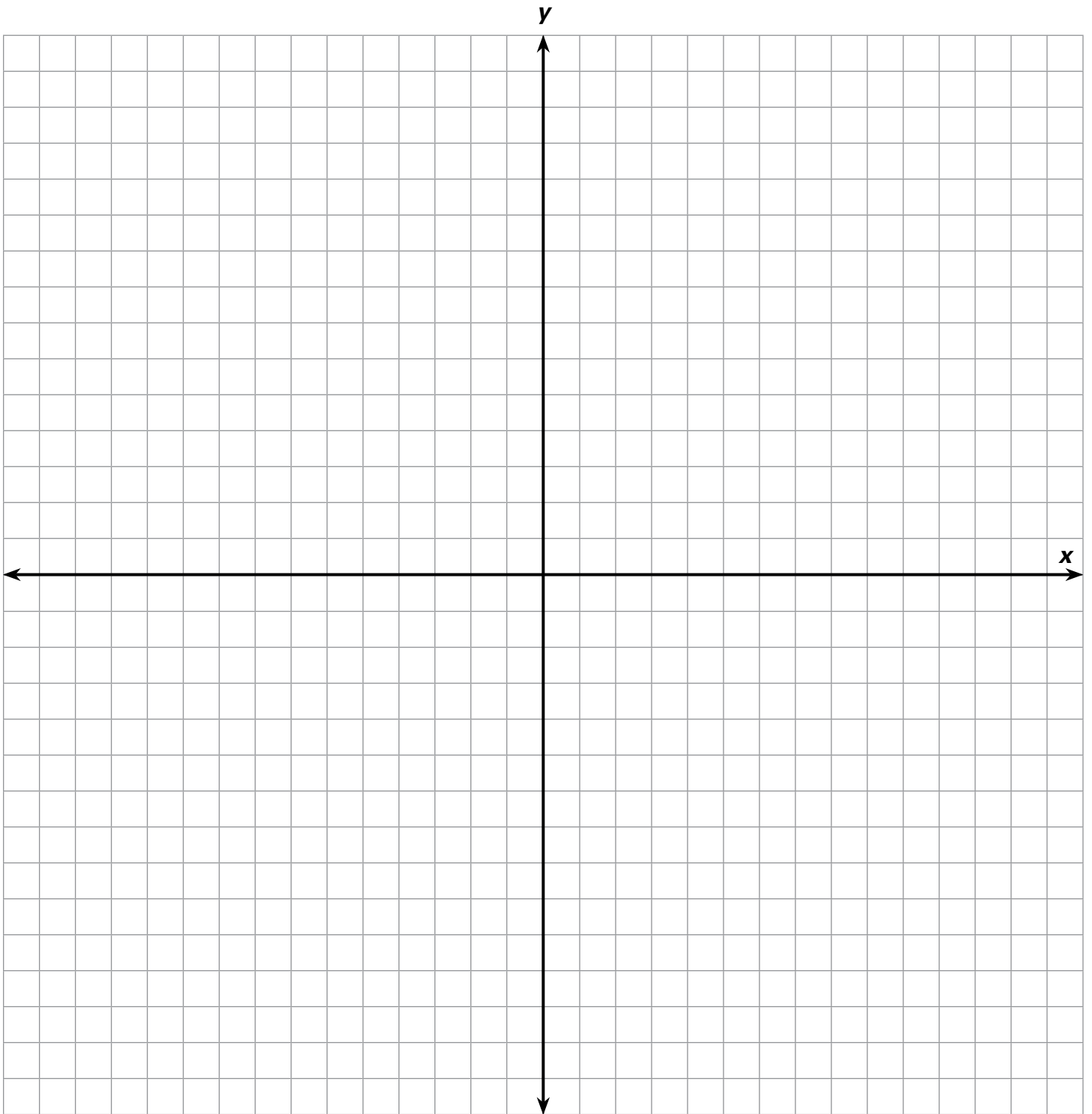
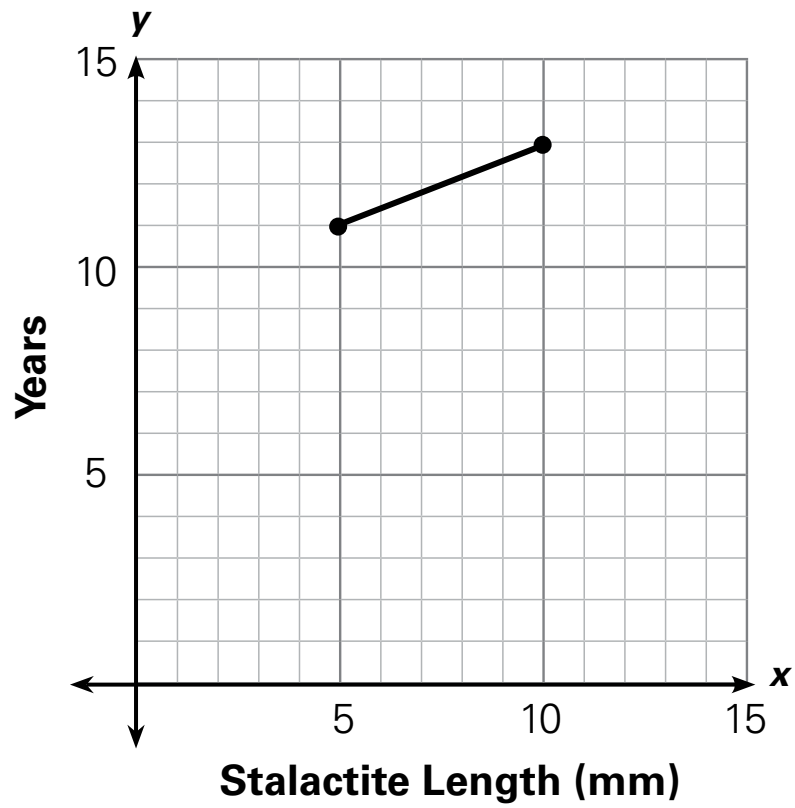7. (6, 12) and (10, 10)   _____

8. (10, 1) and (24, 37)   _____

9. (14, 6) and (19, 9)   _____
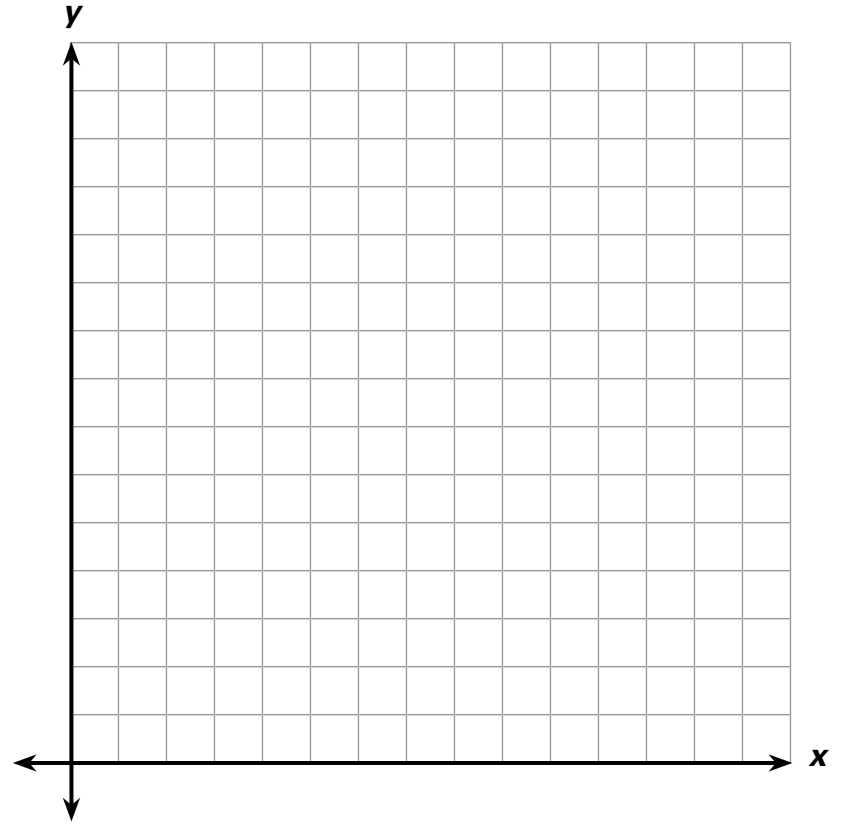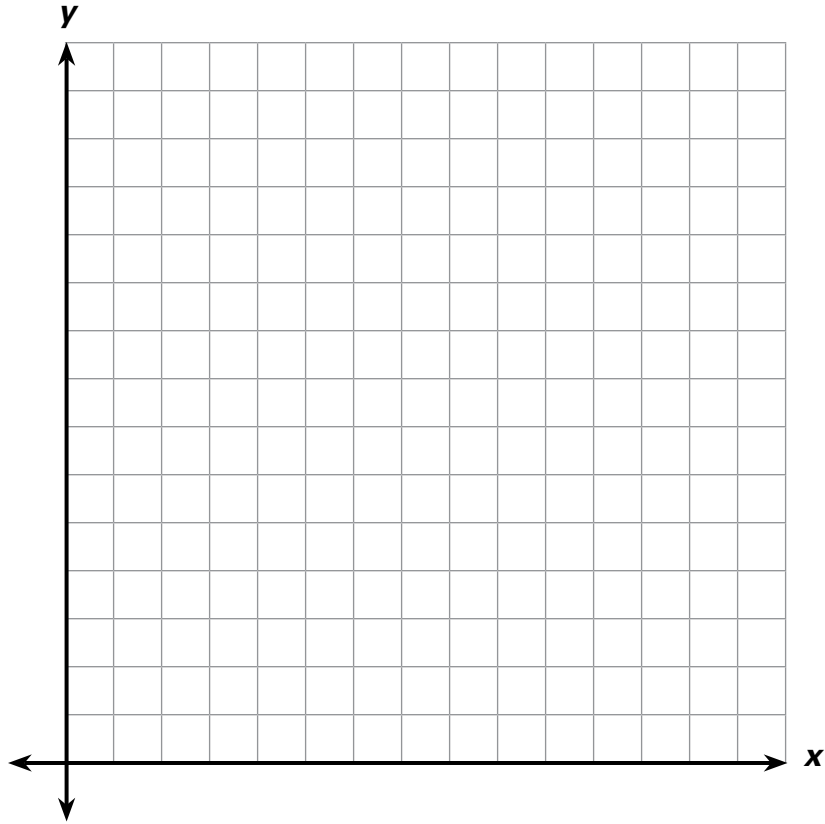
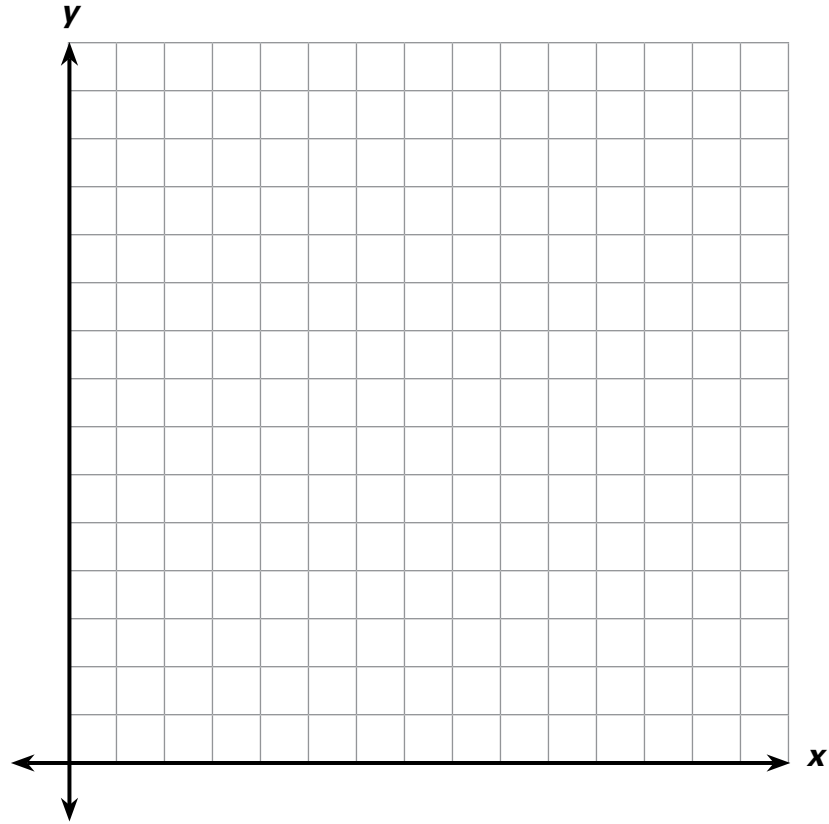10. (45, 33) and (28, 10)   _____

Coordinate Plane

Stalactite Growth

Coordinate Planes (First Quadrant)

Coordinate Planes (First Quadrant)
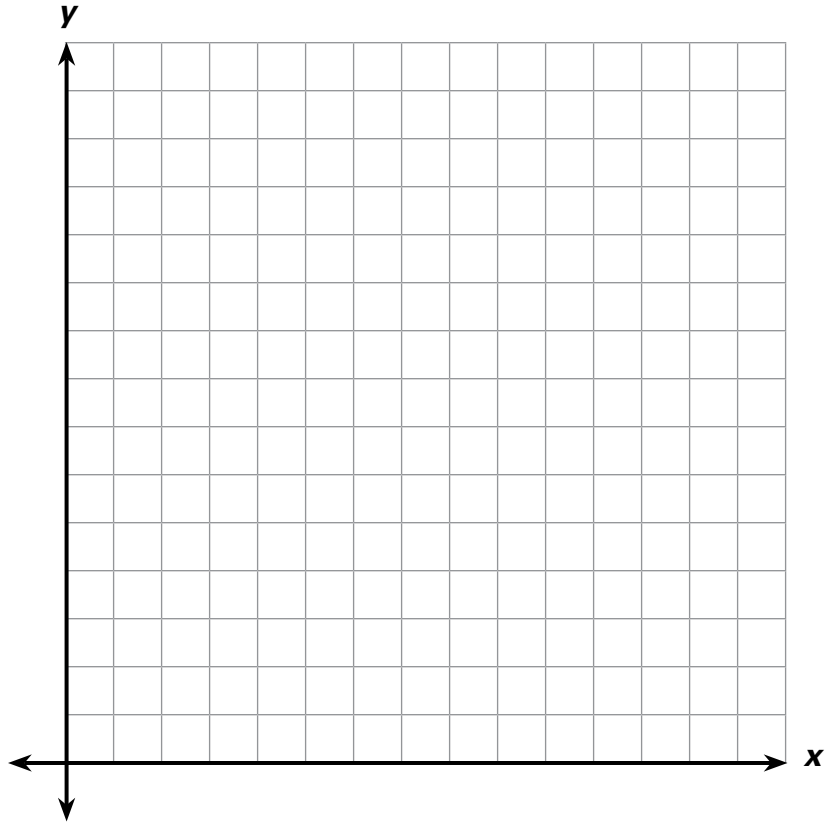
Sweet Buzz

Use a tape diagram to write a linear equation from a graph or table and answer questions.

Amy also wants to sell honeycomb candy, and calls her new brand "Sweet Buzz." She has some candy left from last season and is making more. The graph shows how much candy she made based on the time.
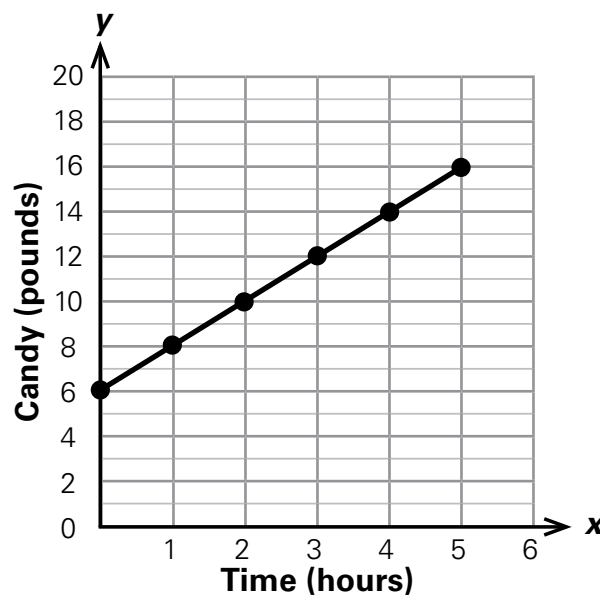
1. What is the *y*-intercept of the graph? How do you

know? _____

_____

_____

2. What does the *y*-intercept tell you about this situation?

_____

3. What is the slope of this line? Show your work.

The slope is _____.

4. What does the slope represent in this situation? _____

_____

5. Write an equation to represent the total amount of Sweet Buzz candy Amy will have over time.

_____

6. How much candy will Amy have if she spends 8 hours making candy? _____

Honey Treats

Review the example problem. Then answer the questions about the data tables.

Example

Write an equation to represent the data table. Then find out how many pounds of candy Amy will have after **10** days.

Days (x)	Pounds of Candy (y)
0	**9**
1	14
2	19
3	**24**
4	**29**

Step 1

Identify the y-intercept by finding the value of y when $x = $ **0**.

The table shows that the value of y when $x = $ **0** is **9**.

y-intercept (b) = **9**

Step 2

Use any two coordinates from the data table and the slope formula to find the slope.

$m = \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{\mathbf{29 - 24}}{\mathbf{4 - 3}} = \dfrac{5}{1} = 5$

slope (m) = 5

Step 3

Use the slope and the y-intercept to write a linear equation.

$y = mx + b$

$y = 5x + $ **9**

Step 4

Since $x = $ the number of days, substitute 10 for x in the equation to find how much candy Amy will have after 10 days.

$y = 5x + $ **9**
$y = 5(10) + $ **9** $ = 59$

Amy will have 59 pounds of candy after 10 days.

1.

Days (x)	Bottles of Honey Mustard Dressing (y)
0	7
1	10
2	13
3	16
4	19
5	22

Linear equation: _____

How many bottles of honey mustard dressing will Amy have after 11 days? _____

2.

Hours (x)	Honey-Glazed Pretzels (y)
0	2
1	12
2	22
3	32
4	42
5	52

Linear equation: _____

How many honey-glazed pretzels will Amy have after 16 hours? _____

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Lesson 35 Exit Ticket

Part 1: The graph shows the linear relationship of the amount of money in Amy's savings account based on time. Use the graph to answer the questions.
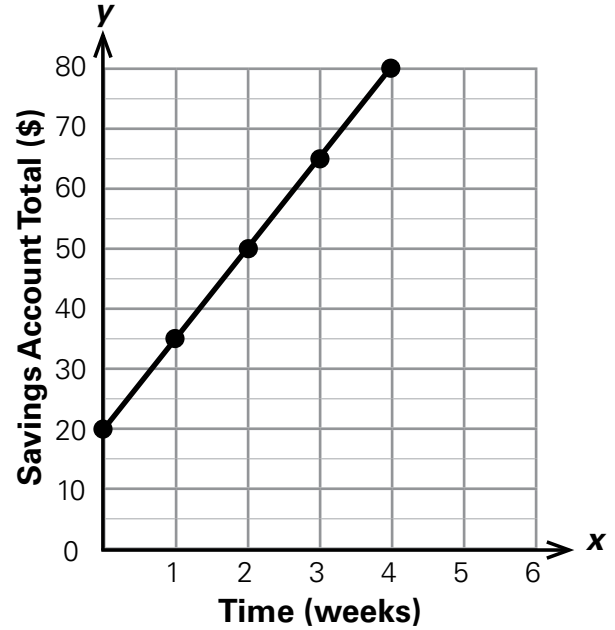
1. What is the slope and *y*-intercept of this data set?

    Slope: _____

    y-Intercept: _____

2. Write an equation to find how much money is in Amy's savings account based on time. You can draw a tape diagram to help.

    _____

3. How much money will Amy have in her saving's account after 104 weeks? _____

Part 2: The table shows the linear relationship of the amount of mileage on Janet's used car over time. Use the table to answer the questions.

Months (*x*)	Car Mileage (*y*)
0	3,984
1	4,234
2	4,484
3	4,734
4	4,984

4. What is the slope and *y*-intercept of this data set?

    Slope: _____

    y-Intercept: _____

5. Write an equation to find how much mileage is on Janet's car for any point in time. You can draw a tape diagram to help.

    _____

6. If the pattern continues, how much mileage will be on Janet's car after 24 months? _____

Extra Practice: Pay Back

Damare just found out that he owes his dad $1,050 for repairs to a painting he ruined by playing basketball in the house. He already has $20 saved. He has four job offers. He can work 120 hours this summer. Based on the data below, which job should he take to pay his dad back?

Bagger at Food-a-Rama

Hours (*x*)	Amount (*y*)
0	20
1	27
2	34
3	41
4	48

1. Write an equation to determine how much Damare will earn in 120 hours:

_____

Shelf Stocker at Family Pharmacy
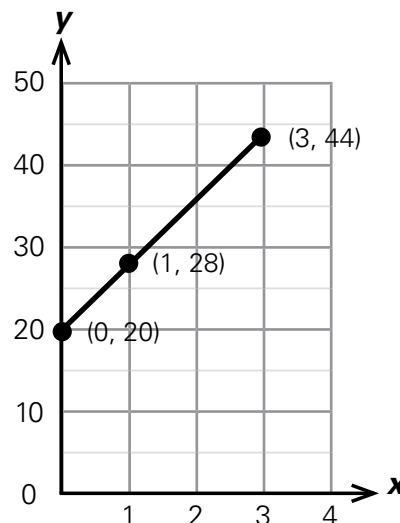
2. Write an equation to determine how much Damare will earn in 120 hours:

_____

Cashier at Posh Pet Place
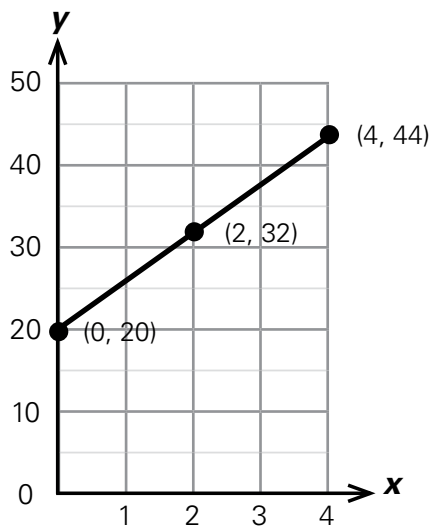
3. Write an equation to determine how much Damare will earn in 120 hours:

_____

Lifeguard

Hours (*x*)	Amount (*y*)
0	20
1	29
2	38
3	47
4	56

4. Write an equation to determine how much Damare will earn in 120 hours:

_____

5. What does the slope represent in each of the equations? _____

6. Which job pays the most? _____

7. How much does it pay per hour? _____

Would You Rather

Job 1:

Hours Worked (x)	Dollars Earned (y)
0	0
1	10
2	20
3	30

Job 2:
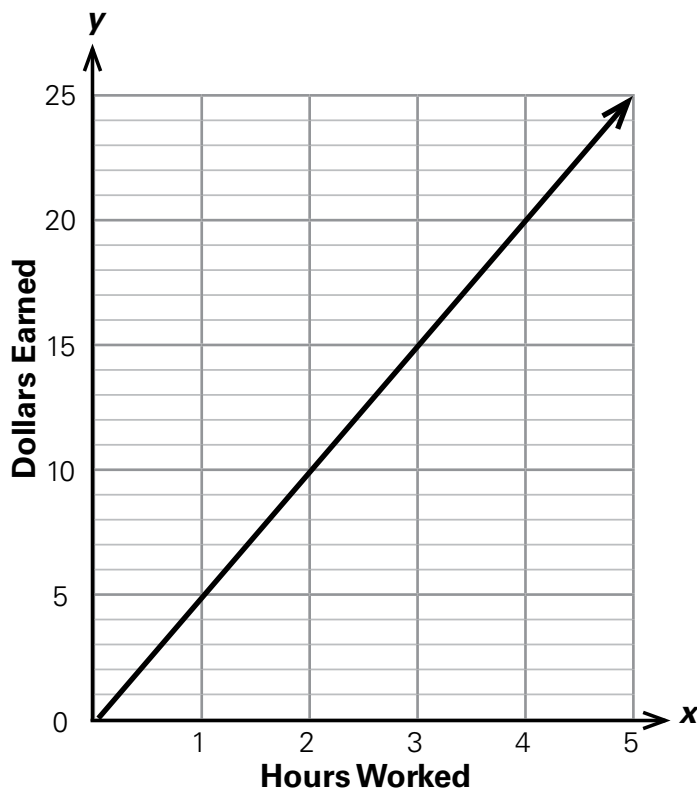
Job 3: $y = 15x$
Where y = dollars earned and x = hours worked

Ian's Savings
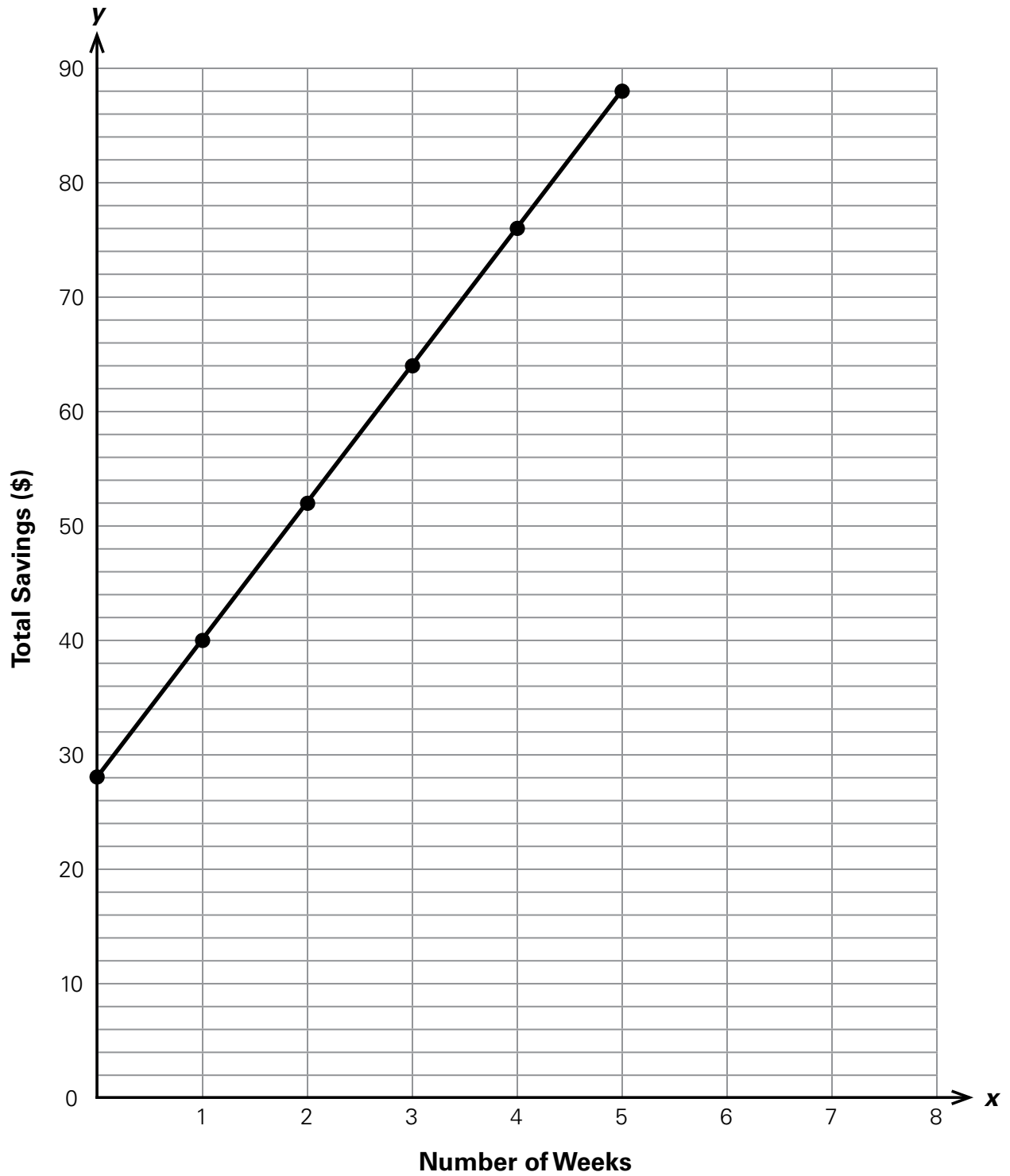

Total Savings ($) (y-axis)

Number of Weeks (x-axis)

Sessions on Sale

Use the linear equations to answer the questions. Graph each linear relationship on a **coordinate plane**.

1. Jaleesa is offering a lower price for new clients. You can use the equation $y = 2x + 15$ to determine how many sessions fit in your budget.

x	y
0	
1	
2	

  a. What is the *y*-intercept? Show your work.

  The *y*-intercept is _____.

  b. What is the slope? _____

  c. Use the equation to complete the data table with three ordered pairs, including the *y*-intercept.

2. Use the equation $y = (-\frac{2}{3})x - 5$.

x	y
0	
1	
2	

  a. What is the *y*-intercept? _____

  b. What is the slope? _____

  c. Use the equation to complete the data table with three ordered pairs, including the *y*-intercept.

3. Use the equation $y = x - \frac{1}{2}$

x	y
0	
1	
2	

  a. What is the *y*-intercept? _____

  b. What is the slope? _____

  c. Use the equation to complete the data table with three ordered pairs, including the *y*-intercept.

Creating Tables and Graphs

Review the example problem. Then find the slope and y-intercept for each linear equation. Complete the data table. Graph each equation on a **coordinate plane**.

Example

Complete a data table and create a graph for the equation $y = 4x + 5$.

Step 1

Identify the y-intercept and slope in the situation.

y-intercept is the y-value when $x = 0$.

$y = 4x + 5$
$y = 4(0) + 5$
$y = 5$

Slope is the value of m in the equation.

$m = 4$

Step 2

Use slope to move from the y-intercept point to additional points. Create a data table to keep track of your points.

y: $5 + 4 = 9$
x: $0 + 1 = 1$

y: $9 + 4 = 13$
x: $1 + 1 = 2$

x	y
0	5
1	9
2	13

Step 3

Graph points on a coordinate plane and connect with a line.

---
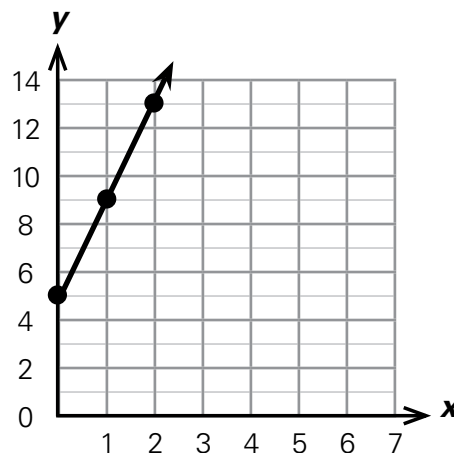
1. $y = 3x + 6$

Slope: _____

y-Intercept: _____

x	y
–2	
–1	
0	
1	
2	

2. $y = -6x + 7$

Slope: _____

y-Intercept: _____

x	y
–2	
–1	
0	
1	
2	

3. $y = \dfrac{2}{3}x + 1$

Slope: _____

y-Intercept: _____

x	y
–2	
–1	
0	
1	
2	

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Lesson 36 Exit Ticket

Part 1: Find the slope and *y*-intercept for the linear equation. Graph the linear relationship on a **coordinate plane**.

1. Dylan keeps track of the distance she runs using the equation $y = 3x + 8$. She wants to model this equation with a graph.

    a. What is the slope and *y*-intercept of this equation?

    Slope: _____

    y-Intercept: _____

    b. On a separate coordinate plane sheet, create a graph of the equation $y = 3x + 8$ with data points where $x = 0$, $x = 1$, and $x = 2$.

Part 2: Find the slope and *y*-intercept for each linear equation. Then, complete the data table.

2. $y = 9x - 11$

Slope: _____

y-Intercept: _____

x	y
−2	
−1	
0	
1	
2	

3. $y = \dfrac{1}{2}x + 5$

Slope: _____

y-Intercept: _____

x	y
−2	
−1	
0	
1	
2	

Extra Practice: Bicycle Problems

Part 1: Emma wants to buy battery-operated lights to weave through the spokes of her bicycle. The price per strand of lights from two companies, including shipping, is below.

Company 1: $y = 5x + 4$ | Company 2: $y = 9x + 4$

Which company has the better deal? Why? _____

_____

Part 2: Emma has decided to buy a new bike. The equations below represent possible warranty options for cost per year plus an upfront cost. Use the equations to complete the data tables for the first 3 years.

Warranty 1: $y = 24x + 10$

x	y

Warranty 2: $y = 35x + 7$

x	y

Which warranty is more expensive after 10 years? _____

Part 3: Shawna completed the data table for the equation $y = 12x + 54$ as shown. Use the data table to answer the questions.

x	y
–2	–96
–1	–42
0	12
1	66
2	120

1. What mistake did Shawna make? _____

_____

2. What should the correct table look like?

x	y

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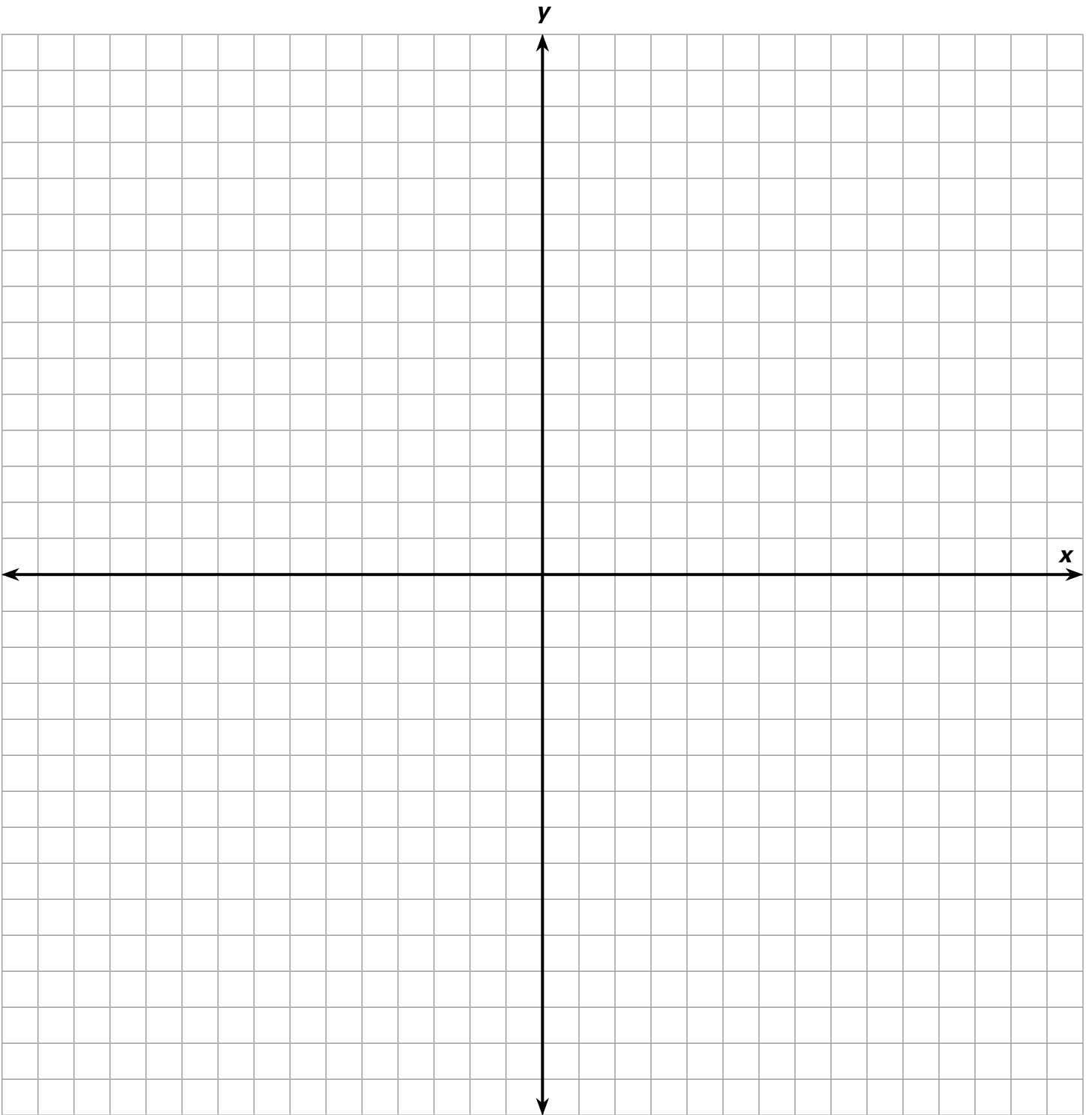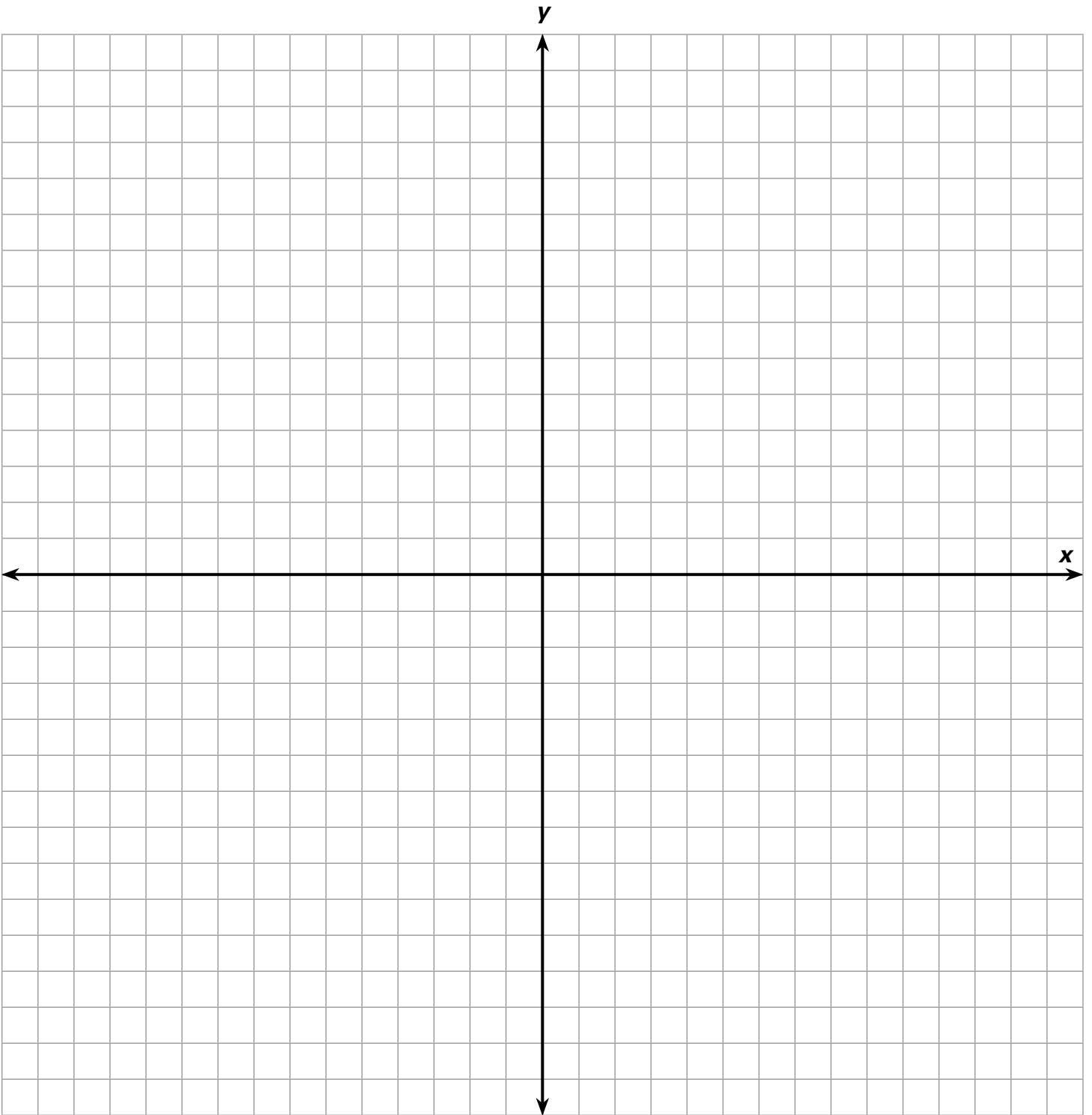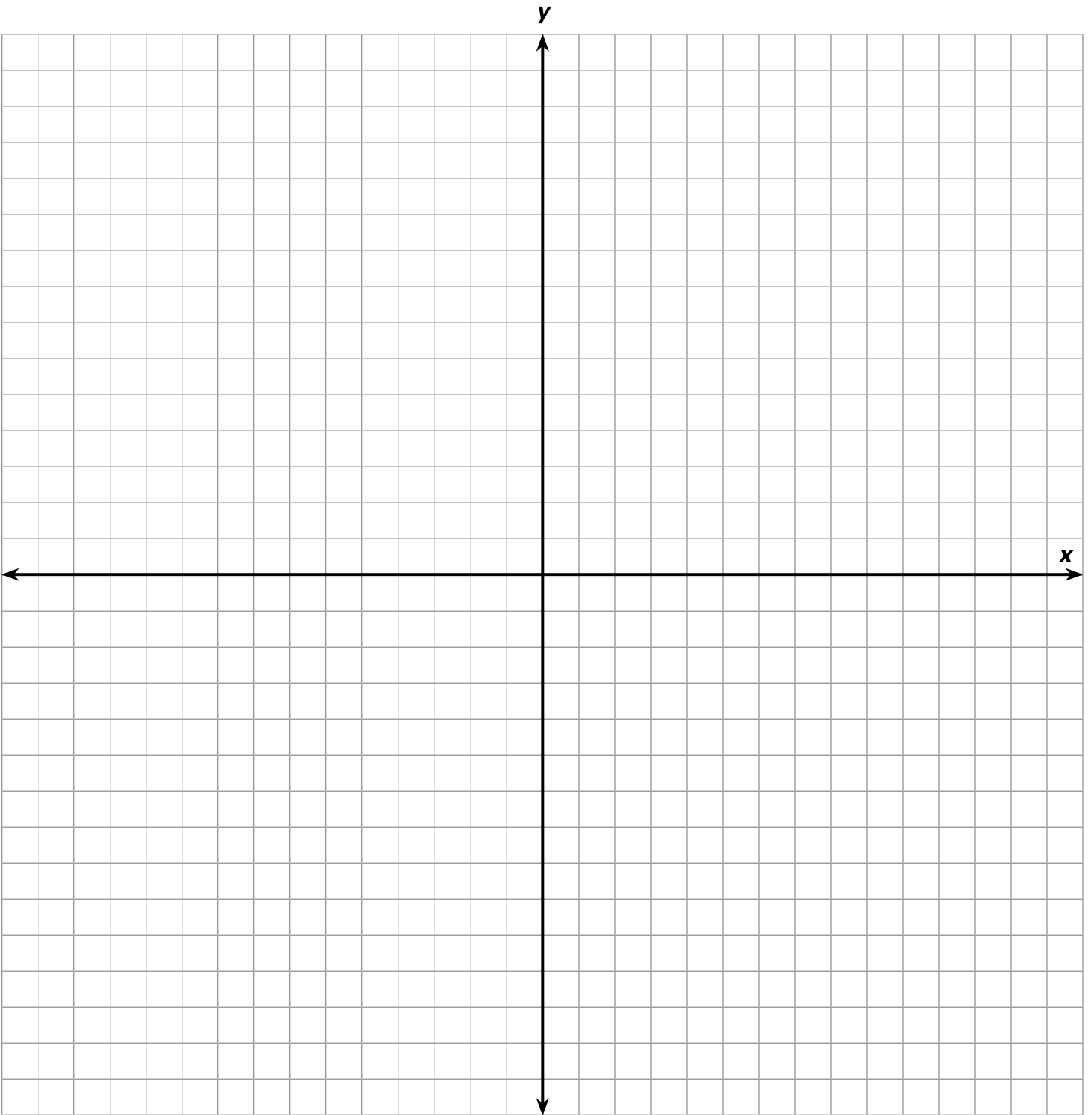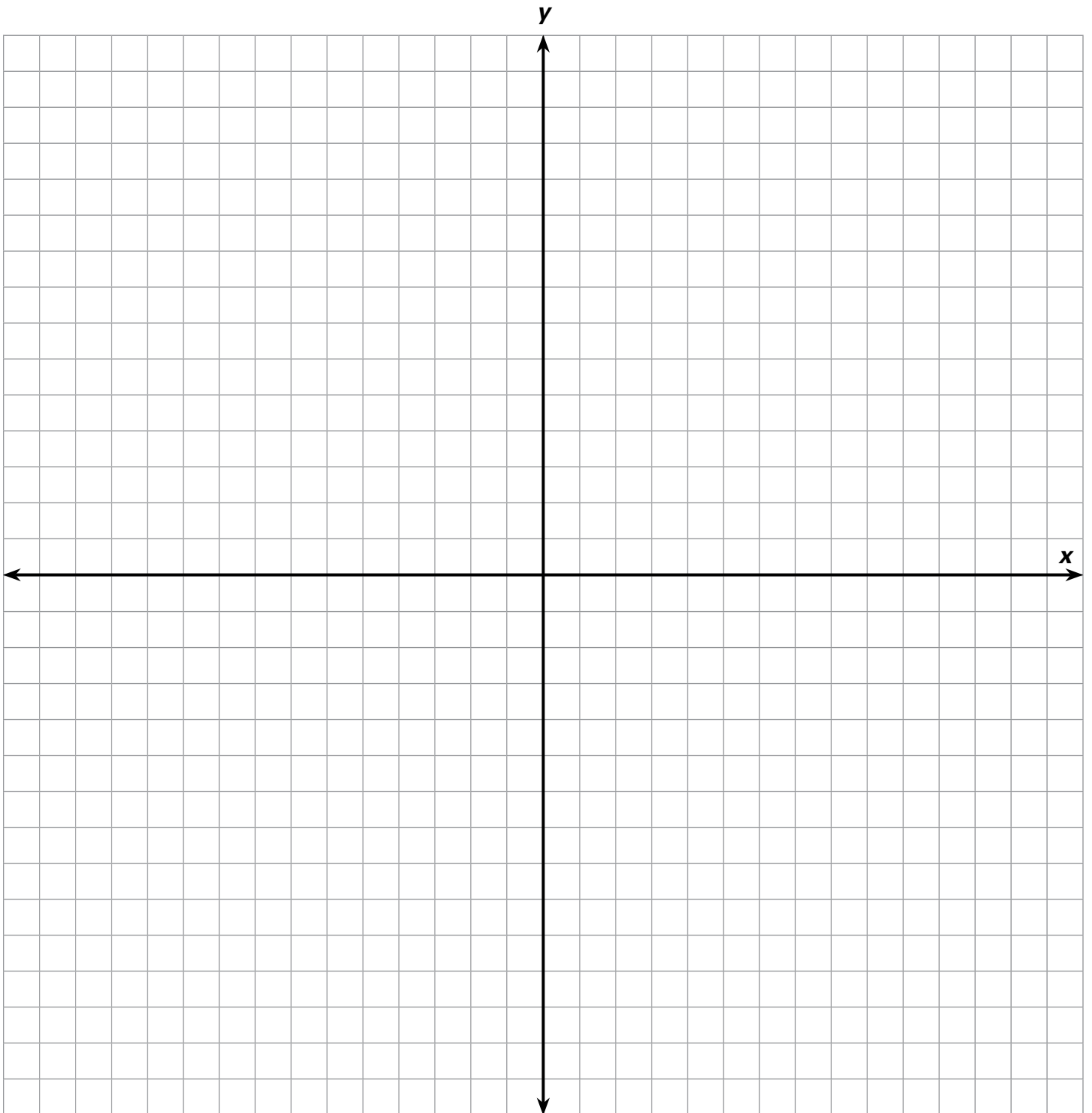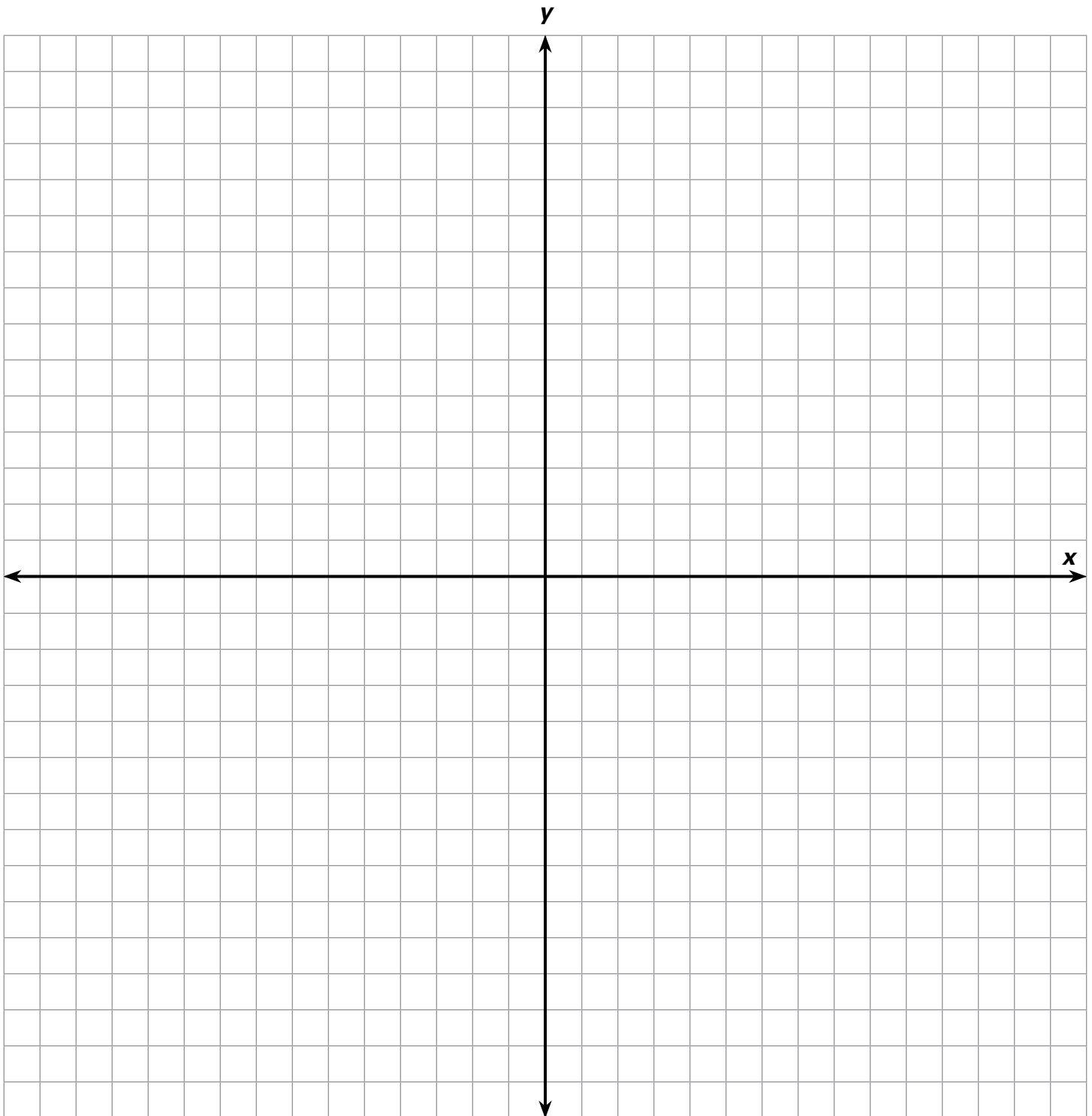
Coordinate Plane

Coordinate Plane

y

x
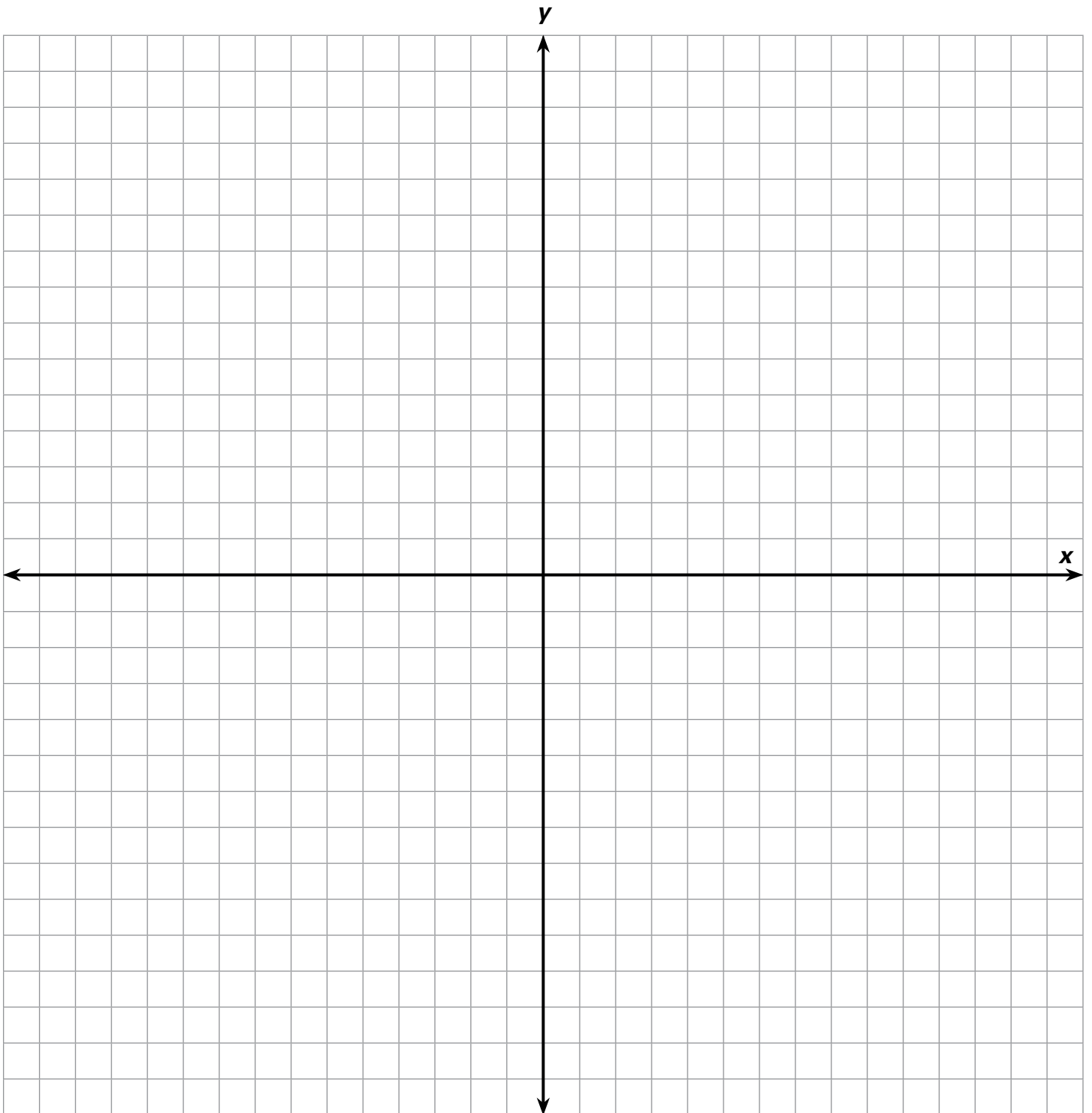
Coordinate Plane

Coordinate Plane

Coordinate Plane

Coordinate Plane

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Coordinate Plane

Coordinate Plane

y

x
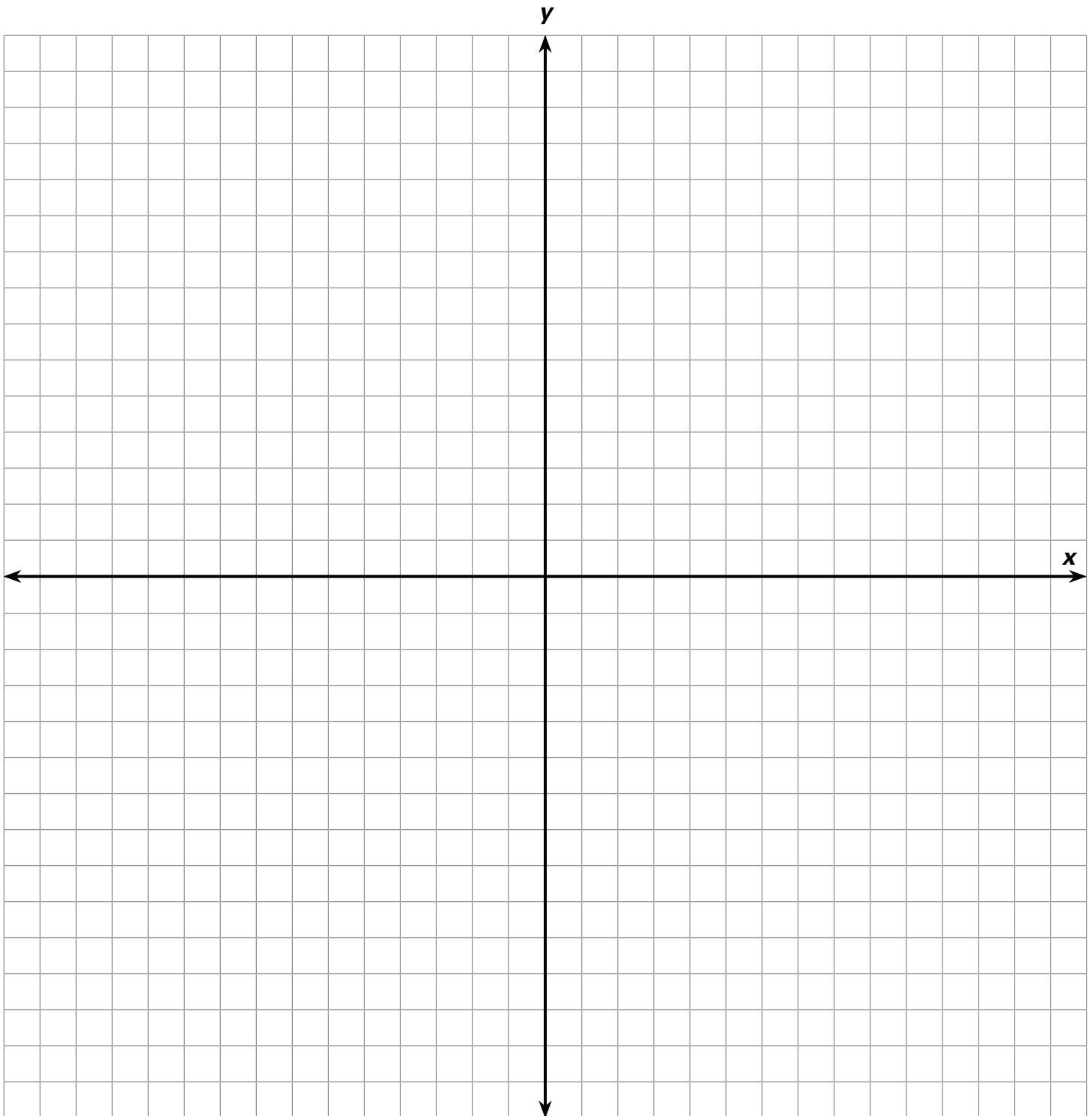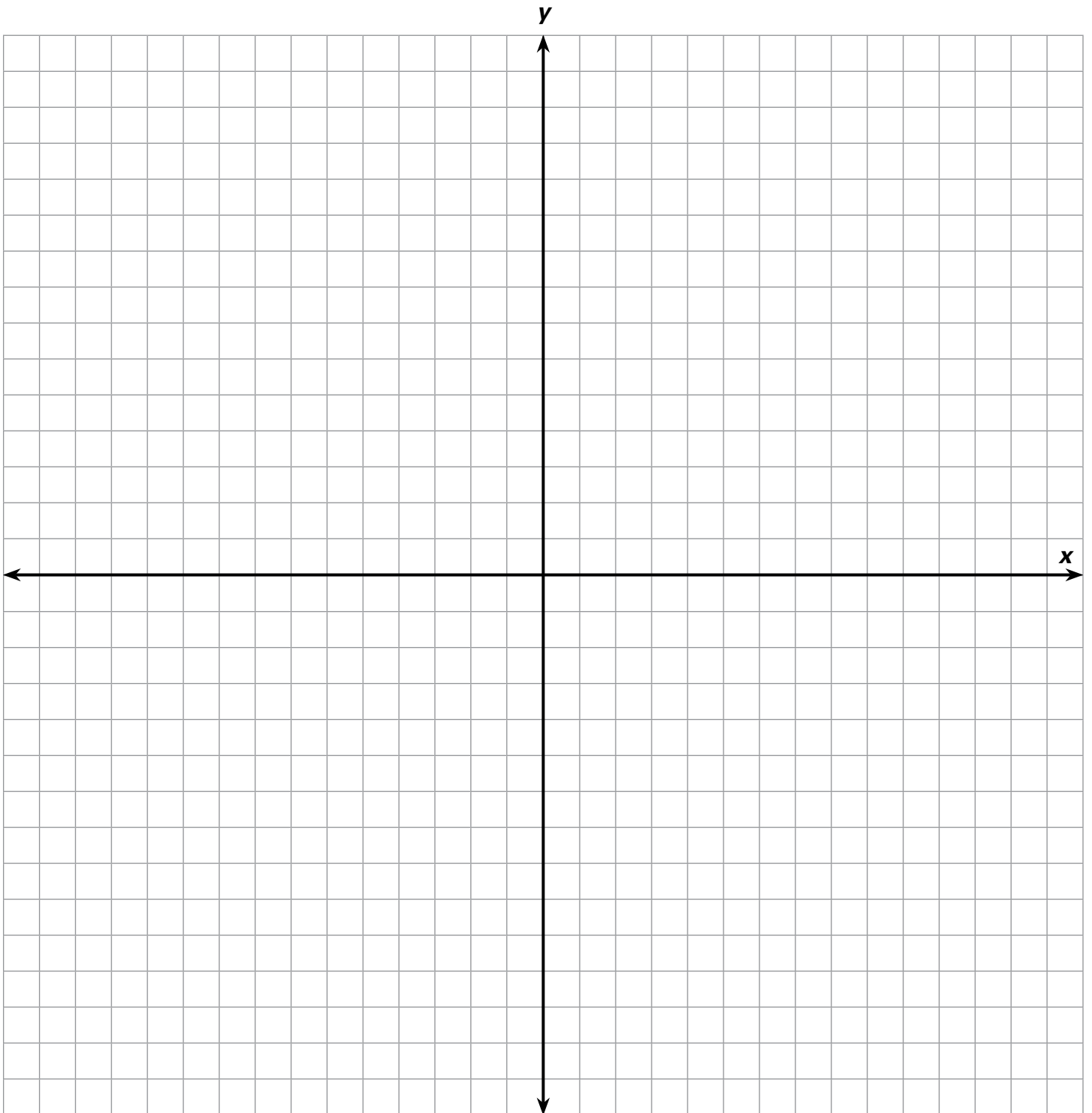
Wildlife Rescue

Use an equation to model the real-world scenario. Then complete a data table and solve the problem.

Raj also volunteers at the Wildlife Rescue facility. His job is to feed the new sea lion, Daisy. The buckets at the rescue hold 6 ½ pounds of fish. Raj noticed that in addition to the buckets, there was a bag containing 10 pounds of fish.

1. What is the slope and *y*-intercept? If the value is not given in the problem, write "unknown."

Slope: _____

y-Intercept: _____

2. Draw a tape diagram to model the total pounds of fish at the rescue.

3. What is the equation to find the total pounds of fish? _____

4. Use the equation to complete the data table.

Number of Buckets (*x*)	Total Fish (pounds)(*y*)
0	
1	
2	
3	
4	

5. If there are 3 buckets of fish at the rescue, how many total pounds of fish does the rescue have?

_____

Rescue Center

Review the example problem. Then answer the questions about the given linear relationships.

Example

It's Teri's job to buy fish food for the aquarium fish. After buying **2** tubs of fish food, the aquarium has **12** pounds of food. After buying **4** tubs, the aquarium has **22** pounds of food.

Step 1

Write the known ratios from the problem in a data table.

Tubs (x)	Pounds of Food (y)
0	
1	
2	12
3	
4	22

Step 2

Use the x- and y-values in the ratio table to find the slope.

$m = \dfrac{y_2 - y_1}{x_2 - x_1}$

$m = \dfrac{22 - 12}{4 - 2}$

$m = \dfrac{10}{2}$

The slope, m, is 5.

Step 3

Use an equation and a point from the ratio table to find the y-intercept.

$y = 5x + b$
$12 = (5)(2) + b$
$12 = 10 + b$
$2 = b$

The y-intercept, b, is 2. This means there were already 2 pounds of fish food.

Step 4

Use the slope-intercept formula to write an equation that models the real-world scenario. Then complete the rest of the data table by substituting values for x.

$y = 5x + 2$

Tubs (x)	Pounds of Food (y)
0	2
1	7
2	12
3	17
4	22

---

1. Bruce logs mammals as they arrive at the center. After 1 month, there are 49 mammals. After 3 months, there are 119.

   a. What is the slope? _____

   b. What is the y-intercept? _____

   c. What equation models the problem?

   _____

   d. Complete a **data table** to show the number of animals for 0–5 months.

2. Keisha is writing a book about the center. After 2 months, she has written 800 words. After 4 months, she has written 1,100 words.

   a. What is the slope? _____

   b. What is the y-intercept? _____

   c. What equation models the problem?

   _____

   d. Complete a **data table** to show the number of words written for 0–5 months.

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Lesson 37 Exit Ticket

Read the problems about linear relationships and answer the questions.

1. Marina works at Off the Rack clothing store. She makes $480 per week. Before her first day, she received a signing bonus of $75. Marina wants to write an equation to find out how much total money she has earned after 3 weeks.

    a. What is the equation to find the total amount Marina has earned? _____

    b. Complete the data table for weeks 0, 1, 3, and 6, using your equation.

    c. How much money does Marina have after 3 weeks?

    _____

(x)	(y)
0	
1	
3	
6	

2. When Marina was hired, she was given some vacation days. She also earns vacation days for each month she works at the store. She decides to save her vacation days and doesn't take any time off. After 2 months, she has 8 vacation days saved up. After 5 months, she has 15 ½ vacation days saved up.

    a. What is the slope? _____

    b. What is the y-intercept? _____

    c. What equation models the problem? _____

    d. Complete the data table to show the vacation days saved up for 0–3 months.

    e. How many vacation days does Marina have after 2 months of work?

    _____

(x)	(y)
0	
1	
2	
3	

Extra Practice: Online Ordering

Part 1: Determine whether the following statements are *true* or *false*.

1. In a real-world situation, the rate is the *y*-intercept of the equation. _____

2. You can use a tape diagram to model a real-world linear relationship. _____

3. A linear equation is always in the form of $x = my + b$. _____

4. You must use a data table or a graph to write an equation for a real-world linear relationship.

_____

5. You can write an equation for a linear relationship if you have the slope and the *y*-intercept.

_____

Part 2: Write an equation for a real-world situation and answer questions.

6. Jade suggests selling sweatshirts with the school mascot on them. The PTA thinks this is a good idea, because they already have 12 sweatshirts like this from a previous fundraiser. Jade orders more sweatshirts. Each box Jade orders has 20 sweatshirts.

   a. What are the slope and *y*-intercept of this situation?

      Slope: _____

      y-Intercept: _____

   b. What is the equation Jade could use to determine the total number of sweatshirts the PTA

      has to sell? _____

   c. Jade ordered 9 boxes of sweatshirts. How many total sweatshirts will the PTA have available to sell? Show your work.

      The PTA will have a total of _____ sweatshirts to sell.

Data Tables

(x)	(y)

(x)	(y)

(x)	(y)

(x)	(y)

Data Tables

(x)	(y)

(x)	(y)

(x)	(y)

| (x)	(y)

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Assessment

Unit 4 Assessment

1. The Java Joint is having travel coffee mugs printed for its grand opening. The company making the travel mugs charges $28 for art setup and $4 per mug.

   a. Write an equation to represent the total cost for the travel mugs. _____

   b. What does the *y*-intercept represent in this relationship? _____

2. Fernando is trying to find the slope of the graph shown.
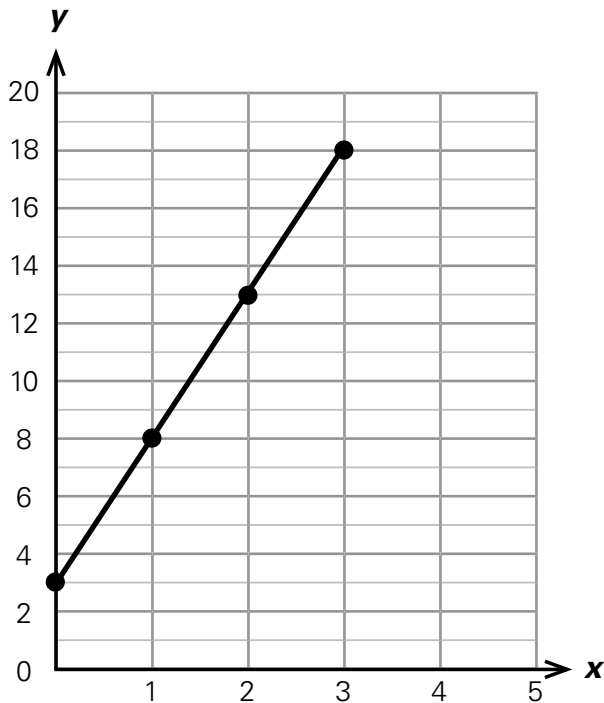
   a. Use similar right triangles to find the slope of the line. Use at least two triangles to verify the slope.

   b. What is the slope of Fernando's graph? _____

3. DeAndre is on a car trip vacation with his family. After 2 days of driving, DeAndre is 640 miles from home. After 5 days of driving, he is 1,600 miles from home.

    a. What are the ordered pairs that represent this situation? _____

    b. Use the slope formula to find the slope of the line between these two points.

    c. The family drives _____ miles each day.

4. What is the slope of the line containing the ordered pairs (1, 36) and (3, 20)? Show your work.

    Slope = _____

5. At the farmer's market, it costs $9 for 6 apples and $21 for 14 apples. Dejay writes the ordered pairs (6, 9) and (14, 21) for the price of apples.

    a. Solve for the slope of this relationship using the slope formula. Show your work.

    b. What does the slope represent in this situation? _____

6. Priya bought a young maple tree at a plant nursery and planted it in her yard. The table shows the height of the maple tree over the first four months after Priya planted it.
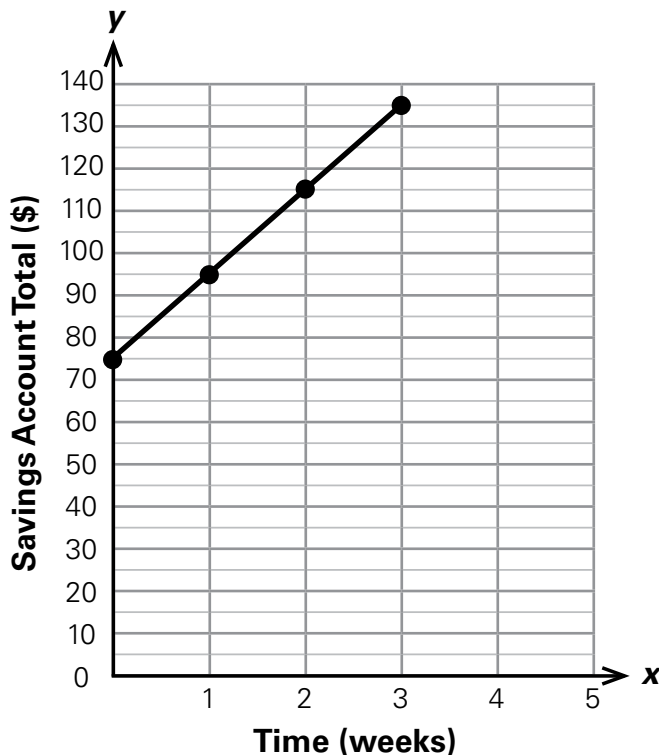
Months (x)	Tree Height in Inches (y)
0	36
1	41.5
2	47
3	52.5
4	58

a. What is the slope of the line? Show your work.

Slope = _____

b. Write an equation to find the height of the tree based on time. _____

7. Sonya opened a new savings account. The graph shows the linear relationship of the amount of money in Sonya's account based on time.

a. What is the slope and y-intercept of this data set?

Slope: _____

y-Intercept: _____

b. Write an equation to find how much money is in Sonya's savings account based on time.

_____

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8. Identify the slope and *y*-intercept for the equation $y = \dfrac{2}{3}x + 9$.
Then use the equation to complete the data table.

Slope: _____

y-Intercept: _____

x	y
0	
1	
2	
3	

9. Use the equation $y = -5x + 5$ to answer the questions.

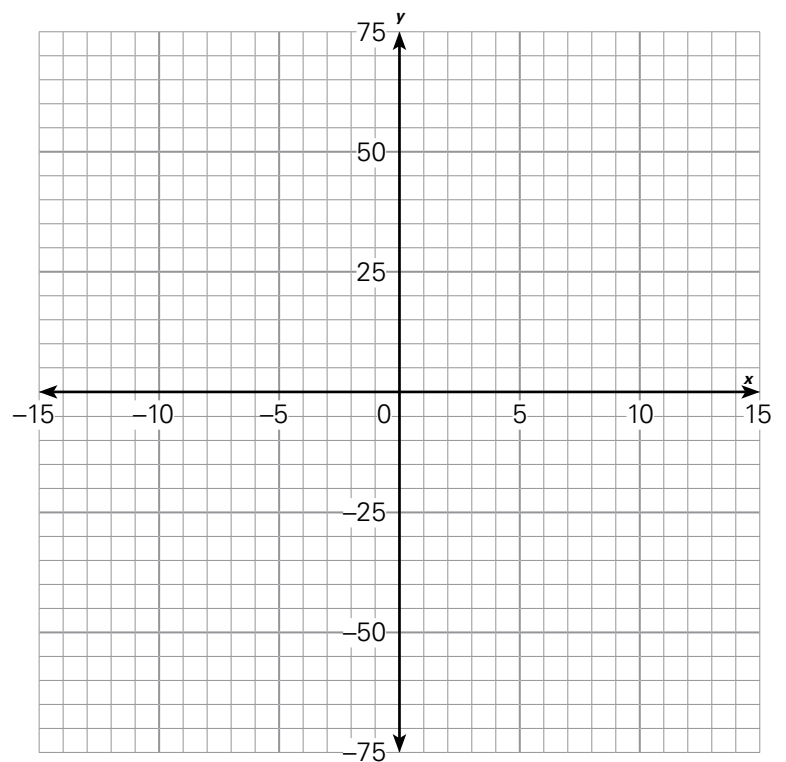**a.** What is the *y*-intercept? Show your work.

The *y*-intercept is _____.

b. Use the equation to complete the data table.

x	y
−10	
−5	
0	
5	
10	

c. Graph the line on the coordinate plane.

10. Zev is going out of town and is putting his dog, Roscoe, in a kennel while he's gone. The kennel charges $12.50 for a drop-off examination and then $7.50 per day for boarding.

   a. What is the equation Zev could use to determine the total cost of Roscoe's stay at the

   kennel? _____

   b. How much will it cost if Zev's gone for 6 days? Show your work.

   It will cost Zev _____.

Unit 4 Cumulative Review

1. What is the side length of a square with an area of 169 square meters?

   _____ meters

2. Simplify the expression. Show your work.

   $5 + 2x + 6 - x + 7x =$ _____

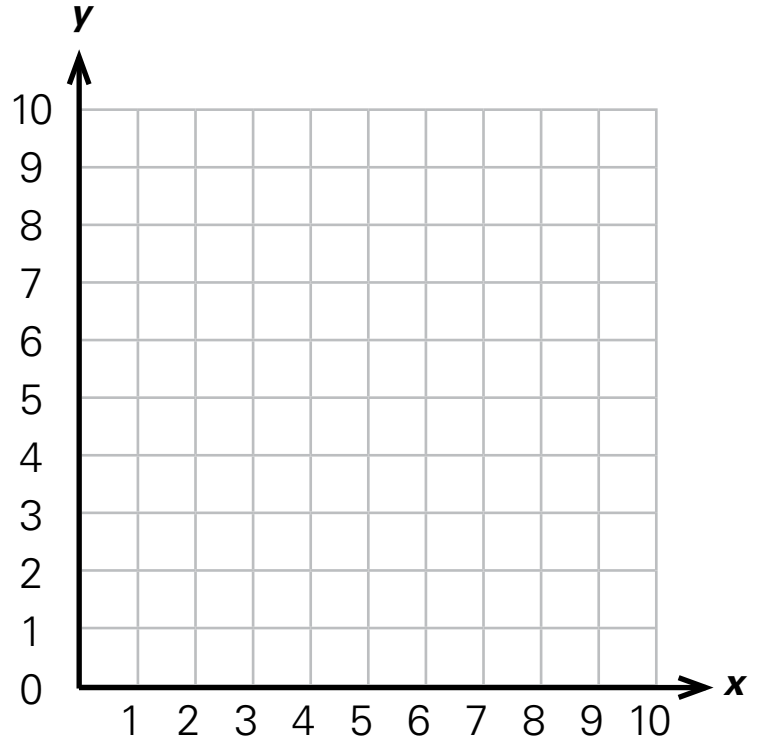3. Write the decimal in scientific notation.

   $0.00000674 =$ _____

4. Solve the equation. Show your work.

   $-9 = 25x + 6$

   _____ $= x$

5. For every chore Layla does, she earns $1.50. Write an equation to represent the proportional relationship, then graph the relationship on the coordinate plane.

Equation: _____

6. Label each number as rational or irrational.

π	
1.73	
$6\frac{1}{2}$	
$\sqrt{8}$	
$19.\overline{5}$	

7. Match the ordered pairs with the correct slope.

(4, 48) and (10, 120)   35

(2, 70) and (5, 175)   26

(6, 84) and (23, 322)   19

(9, 234) and (17, 442)   14

(3, 57) and (14, 266)   12

8. Solve. Show your work.

$$48 = \frac{3}{4}x + 15$$

_____ = x

9. Fran, Wesley, and Binh each solved $12^{12} \div 12^3$ and got different answers shown in the table.

Fran	$12^{12} \div 12^3 = 12^{15}$
Wesley	$12^{12} \div 12^3 = 12^9$
Binh	$12^{12} \div 12^3 = 12^4$

Which student is correct? _____

10. Lianne deposited $60 into a savings account. Then, every week, she deposited $25 from her paycheck into the account. Write an equation Lianne could use to determine the total amount in her savings account after any number of weeks.
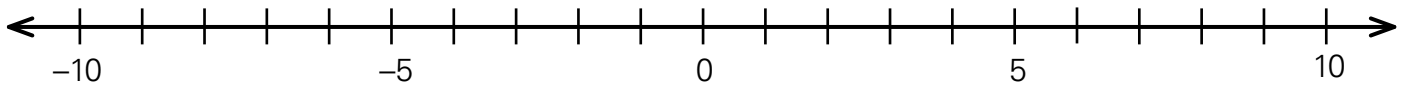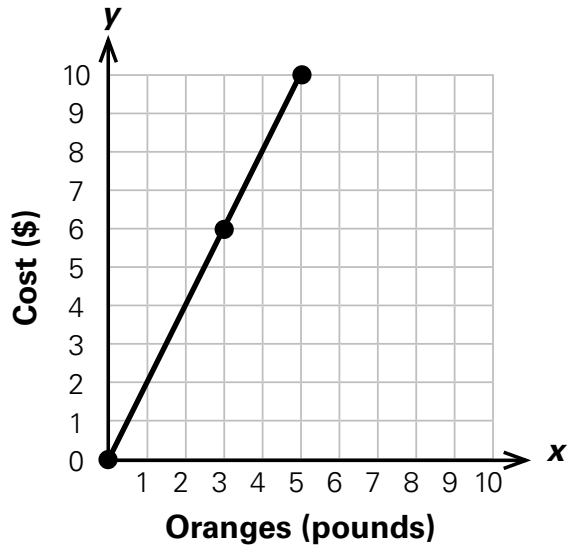
_____

11. Factor the expression.

$48x + 93 =$ _____

12. Solve the inequality for x and graph the solution on the number line. Show your work.

$30 > 2x + 24$

_____ $> x$

13. The graph shows the prices for different pounds of oranges at the grocery store. Write an equation that represents the relationship between pounds of oranges and cost.

Equation: _____

14. Solve the equation. Show your work.

$5(-6 + p) = 105$

$p =$ _____

15. Keiko invests $2,000 in an account that pays 3% simple interest per month.

    a. How much interest will Keiko have earned after 8 years? Use the formula $I = prt$. Show your work.

          $I = $ _____

    b. How much money will be in Keiko's account after 11 years? Use the formula $I = prt$. Show your work.

        Keiko will have _____ dollars in her account after 11 years.