

 Amplify Desmos Math CALIFORNIA

Grade 5

Volume 2: Unit 7

Student Edition



Unit 7

Shapes on the Coordinate Plane

Big Ideas in This Unit

- CC1 Plotting Patterns Telling a Data Story
- CC2 Modeling
- CC4 Shapes on a Plane

Questions for Investigation

- How do you know the most specific name for a shape?
- How can you use the coordinate grid to represent and interpret mathematical and real-world problems?



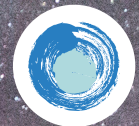
Explore: Sorting Objects

How can you show categories?



Unit Story: Hanan Pacha

In this story, Mia visits her grandfather in Chile and learns about the heritage of her ancestors and the beauty of “looking up” once in a while.



Watch Your Knowledge Grow

This is the math you'll explore in this unit. Rate your understanding to see how your knowledge grows!

Not yet Almost I got it!

I can . . .	Before	After
Describe and identify quadrilaterals, including a trapezoid, using defining attributes such as parallel lines, angle measurements, and side lengths.	<input type="radio"/> — <input type="radio"/> — <input type="radio"/>	<input type="radio"/> — <input type="radio"/> — <input type="radio"/>
Describe, identify, and plot points on the coordinate grid, including horizontal and vertical lines and the axes.	<input type="radio"/> — <input type="radio"/> — <input type="radio"/>	<input type="radio"/> — <input type="radio"/> — <input type="radio"/>
Generate numerical patterns and identify the relationship between the corresponding terms.	<input type="radio"/> — <input type="radio"/> — <input type="radio"/>	<input type="radio"/> — <input type="radio"/> — <input type="radio"/>
Graph the ordered pairs from corresponding terms in 2 patterns on a coordinate grid.	<input type="radio"/> — <input type="radio"/> — <input type="radio"/>	<input type="radio"/> — <input type="radio"/> — <input type="radio"/>
Represent and interpret data on a coordinate grid.	<input type="radio"/> — <input type="radio"/> — <input type="radio"/>	<input type="radio"/> — <input type="radio"/> — <input type="radio"/>
Interpret coordinates on a graph to solve real-world problems.	<input type="radio"/> — <input type="radio"/> — <input type="radio"/>	<input type="radio"/> — <input type="radio"/> — <input type="radio"/>

Classifying Shapes

✦ Unit Story: Hanan Pacha



Allison H. Smith/Shutterstock.com

What are some things that can be called the same name but have different unique features that give them other names?

Explore: Sorting Objects

How can you show categories?



Warm-Up



eyes on teacher



I am a doer of math.
Why is it important to talk about math with others?

Discuss What do you notice? What do you wonder?

Hanan Pacha

Unit Story





With your group, decide how to organize the objects in your set.

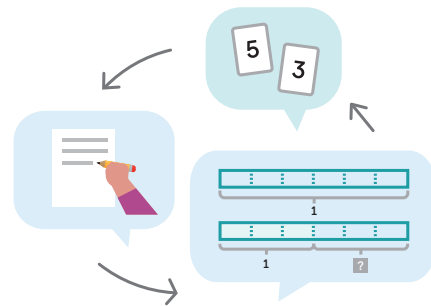
- Move the objects around to show categories and categories within the categories.
- On chart paper, show how you organized the objects.

Ways to be a mathematician

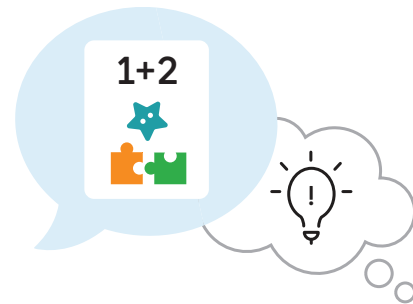
- 1** I can take my time to think about a challenging problem before trying to solve it.



- 2** I can use numbers, words, and diagrams to make sense of math ideas and situations.



- 3** I can work carefully and try to be clear when I share my ideas.



Sorting Quadrilaterals

Let's describe and classify quadrilaterals.



Warm-Up



eyes on teacher



We are a math community.

What other communities do you belong to?

Activity

1

Introducing the Center, Mystery Shape

Stage 7



Pairs Let's determine the mystery shape.

You'll need: sticky notes, Quadrilateral Cards, Grade 5, Recording Sheet



Set Up Organize the Quadrilateral Cards faceup in rows.



How to Play

- 1 Player A:** Choose a mystery shape and draw it on a sticky note. Do not show your partner.
- 2 Player B:** Ask *yes* or *no* questions and flip cards facedown as you determine they are not the mystery shape. Record each question and your partner's response.
- 3 Partner B:** When you are ready, you have one guess to identify the mystery shape. Draw the shape you guess on your Recording Sheet. If you are correct, you earn 1 point.
- 4** Switch roles and repeat. Play 3 rounds.



How to Win The player who earns more points wins.

Mystery Shape (continued)

Round 3							Correct shape:
							My guess:
Round 2							Correct shape:
							My guess:
Round 1							Correct shape:
							My guess:
Questions							Shapes

Card Sort: Quadrilaterals

Hands-On

You and your partner will use the same set of cards from Mystery Shape.

1 Sort

Sort all the quadrilateral cards using any strategy. Name the categories in your sort.

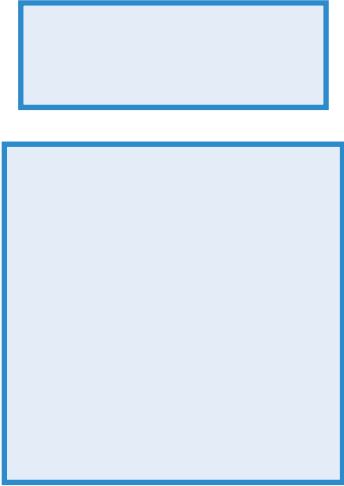
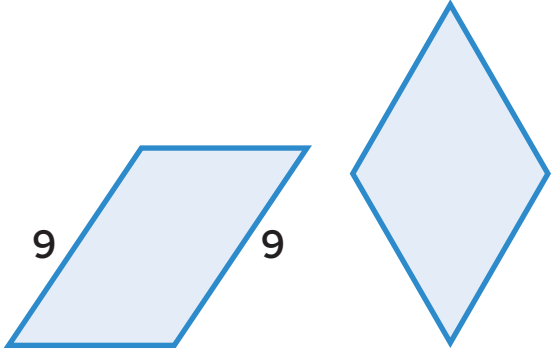
2 Discuss

Join another pair. Share your categories.

What is similar? What is different?

Summary 7.02

A quadrilateral is a shape with 4 sides. You can describe and classify quadrilaterals using their attributes, such as side lengths, angle measurements, and whether the sides are parallel or perpendicular lines.

4 right angles	2 pairs of parallel sides
	

Practice 7.02

For Problems 1 and 2, select *all* the quadrilaterals that fit the clue.

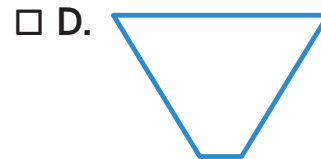
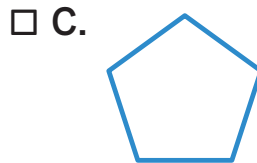
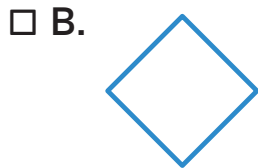
1 🗣️ I have 2 sets of parallel sides.

- A. square
- B. rhombus
- C. parallelogram
- D. rectangle

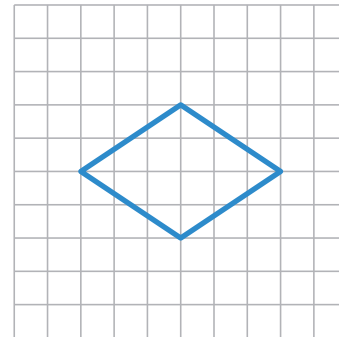
2 🗣️ All my sides are equal in length.

- A. parallelogram
- B. rhombus
- C. square
- D. rectangle

3 Which figures are quadrilaterals? Select *all* that apply.



Consider the figure for Problems 4–7. Determine whether each statement is *true* or *false*. Explain your thinking.



4 The figure is a rectangle.

5 The figure is a square.

6 The figure is a rhombus.

7 The figure is *not* a parallelogram.

Spiral Review

The table shows the distance that 4 stars are from the Sun in light-years. Use the table for Problems 8 and 9.

Star	Distance (light-years)
Wolf 1061	14.04
Gliese 1061	11.98
Struve 2398 A	11.49
α Centauri B	4.37

 Show your thinking.

- 8** Determine the distance between Struve 2398 A and α Centauri B.

answer: _____

- 9** Determine the distance between Wolf 1061 and Gliese 1061.

answer: _____

For Problems 10 and 11, evaluate the expression.

10 $20 - (5 \times 3)$

11 $88 + (18 \div 6)$

Identifying Quadrilaterals

Let's use defining attributes to identify a trapezoid.



Warm-Up



eyes on teacher



I can be all of me in math class.
Shapes with the same name can have unique attributes. How are mathematicians like that?

Activity

1

What Is a Trapezoid?

- Use Trapezoids A–C to describe what attributes a trapezoid *must* have and what attributes a trapezoid *may* have.

A trapezoid <i>must</i> have . . .	A trapezoid <i>may</i> have . . .

- Discuss**

Based on your descriptions, is a parallelogram a trapezoid?

Card Sort: Quadrilaterals in the Constellations

Hands-On

You and your partner will be given a set of cards with clues about quadrilaterals and diagrams of constellations that include quadrilaterals.

3 Sort

Match each clue with a constellation based on the attributes of the quadrilateral. Record your matches in the table. Then name each quadrilateral.

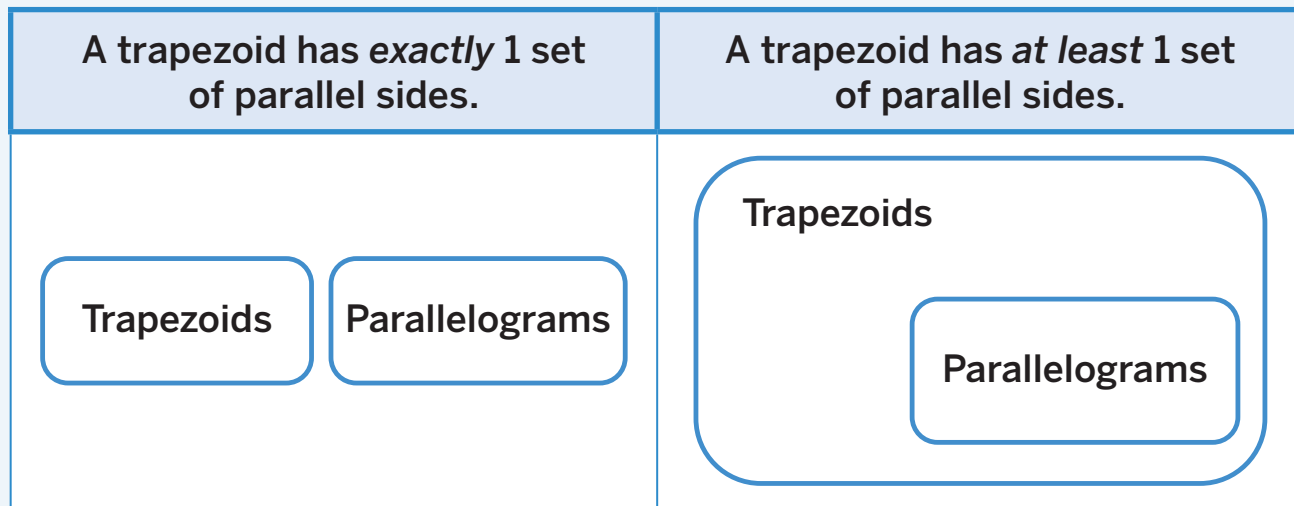
Constellation	Clue card	Quadrilateral
Cepheus (The King)		
Pegasus (The Winged Horse)		
Ursa Major (The Great Bear)		
Ursa Minor (The Little Bear)		
Draco (The Dragon)		

4 Discuss

Join another pair. Share and explain your classifications using attributes. If there is a disagreement, discuss whether both classifications could be true.

Summary 7.03

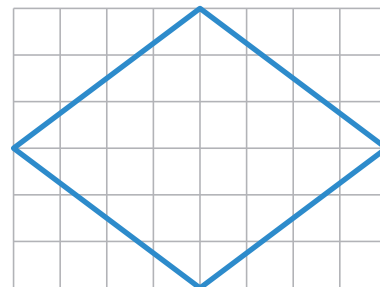
There are 2 definitions of a trapezoid that use different **defining attributes**. The definition used determines the relationship between a parallelogram and a trapezoid.



defining attribute A trait or property a shape *must* have.

Practice 7.03

For Problems 1–3, determine whether the statement about the shape is *true* or *false*. Explain your thinking.



1 The shape is a rhombus.

2 The shape is a square.

Practice 7.03

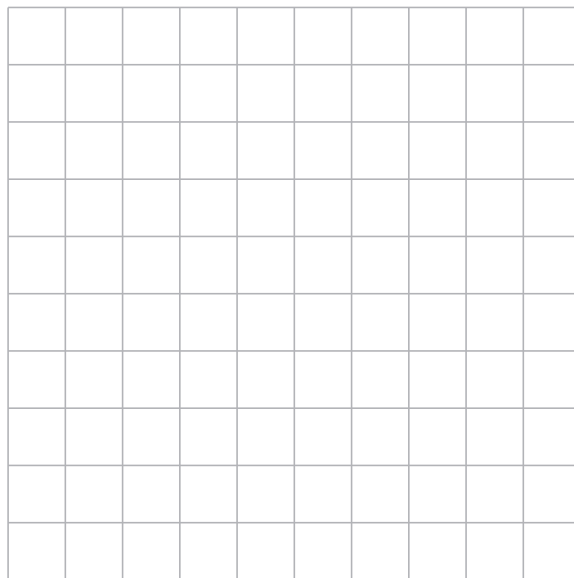
Name _____ Date _____


3 The shape is a trapezoid.

4 Draw and label Shapes A and B on the grid.

- Shape A is a trapezoid and a parallelogram.
- Shape B is a trapezoid, but it is *not* a parallelogram.

 Draw



5  Determine whether each statement is true or false. Select True or False for each statement.

	True	False
A trapezoid always has 2 sets of parallel sides.		
A parallelogram always has 2 sets of parallel sides.		
All parallelograms are trapezoids.		

Spiral Review

For Problems 6 and 7, evaluate the expression.

 Show or explain your thinking.

6 16×0.48

answer: _____

7 $16 \div 0.02$

answer: _____

8 Represent 30 as a multiplication expression using only its prime factors.

 Show or explain your thinking.

answer: _____

All Types of Quadrilaterals

Let's explore the relationships between quadrilaterals.



Warm-Up



eyes on teacher



I can be all of me in math class.

Defining attributes are characteristics a shape must have. What attributes define you?

Activity

1

Card Sort: Quadrilateral Clues

You and your partner will be given a set of cards with different shapes.

1 Sort

Match each shape card with the clue that best describes it. One clue does not have a match. Be prepared to explain your thinking.

Clue	Card
a trapezoid that is not a rectangle	
a rhombus that is also a square	
a rectangle that is not a square	
a rhombus that is not a square	
a square that is not a rectangle	
a quadrilateral that is not a parallelogram	
a parallelogram that is not a rectangle	

2 Discuss

Which clue did not have a card? Why?

Always, Sometimes, Never

Complete each statement with *always*, *sometimes*, or *never* to make it true. Be prepared to explain your thinking.

3 A rhombus is _____ a square.

4 A square is _____ a rhombus.

5 A rectangle is _____ a rhombus.

6 A square is _____ a rectangle.

7 A rectangle is _____ a parallelogram.

8 A parallelogram is _____ a rhombus.

9 A triangle is _____ a quadrilateral.

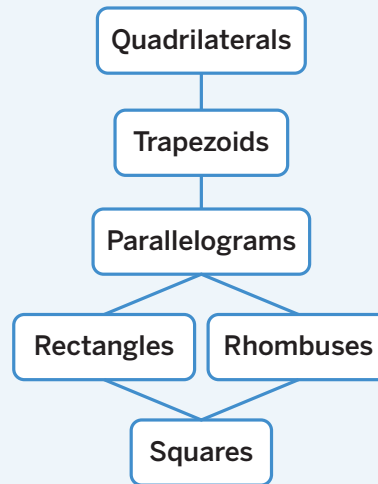
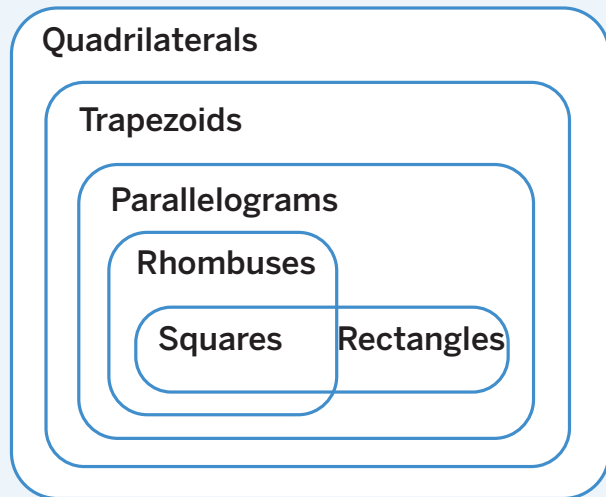
10 A trapezoid is _____ a parallelogram.

11 **Discuss** 

Join another pair. Share and justify your answers to Problems 3 and 4. If there is disagreement, discuss until you reach an agreement.

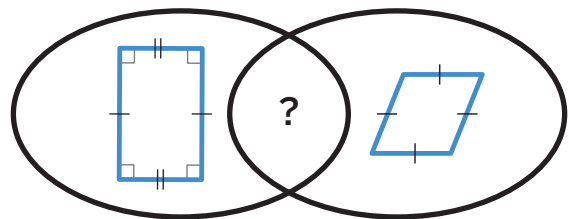
Summary 7.04

Quadrilaterals can have many names based on their attributes. A diagram can help identify all of a quadrilateral's names, including its most specific name.



Practice 7.04

- 1 Which type of quadrilateral belongs in the middle section of the Venn diagram?



- (A) rectangle (B) rhombus (C) square
(D) trapezoid (E) parallelogram

Practice 7.04

Name _____ Date _____

For Problems 2–5, determine whether the statement is *true* or *false*.

2 A parallelogram is sometimes a rhombus. _____

3 A rhombus is always a parallelogram. _____


4 A trapezoid is never a rectangle. _____


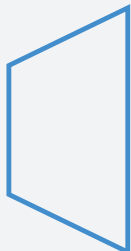
5 A rectangle is never a square. _____

6 Choose 1 true statement and 1 false statement from Problems 2–5 and explain your thinking.

true: _____

false: _____

7  Determine which category each quadrilateral belongs to. Select **all** boxes that apply. Shapes may belong to more than one category.

	square	rhombus	trapezoid	rectangle	parallelogram
					
					

Spiral Review

For Problems 8 and 9, evaluate the expression.

 Show your thinking.

8 $\frac{3}{2} + \frac{6}{5}$

answer: _____

9 208×76

answer: _____

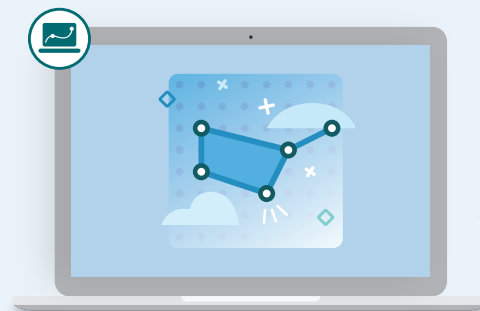
For Problems 10 and 11, determine the value of the expression.

10 6×10^2 _____

11 $6 \div 10^2$ _____


A Question of Shape

Let's play a game to identify quadrilaterals.



Warm-Up

1

 eyes on teacher

We are a math community.

Just as Mia learned from others, how can you learn from others today?

Activity

1

Mystery Shape

2

To play the game, Partner A will choose a mystery shape. Partner B will ask yes-or-no questions that include a shape's name and use the gameboard to eliminate shapes based on Partner A's responses.

Partner A: Choose a mystery shape. Do not tell your partner your shape.

Partner B: Ask your partner a *yes* or *no* question to eliminate possible shapes. Continue asking questions and updating your gameboard until you can identify Partner A's mystery shape.

Play up to 4 rounds.

Discuss

What is your partner's mystery shape?

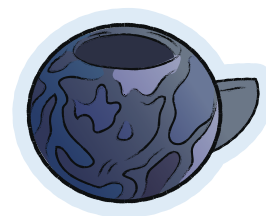
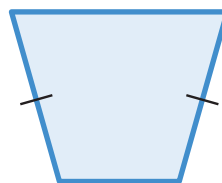
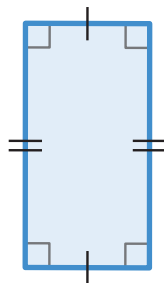
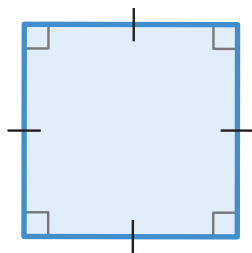
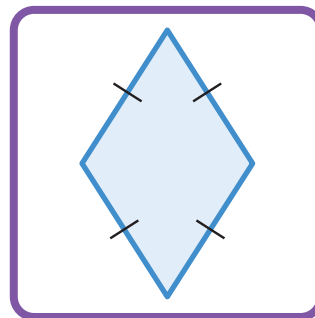
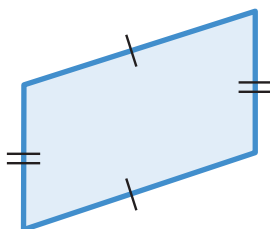
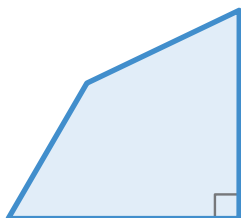
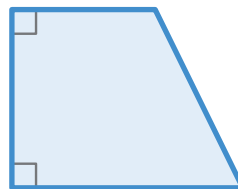
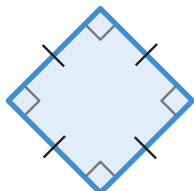
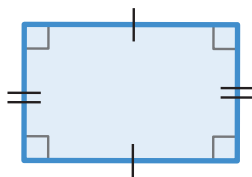
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Mystery Shape (continued)

3

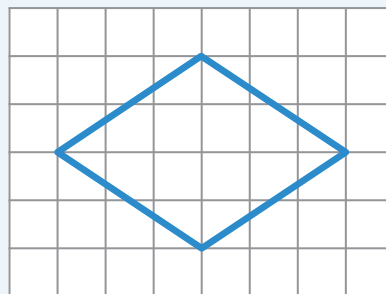
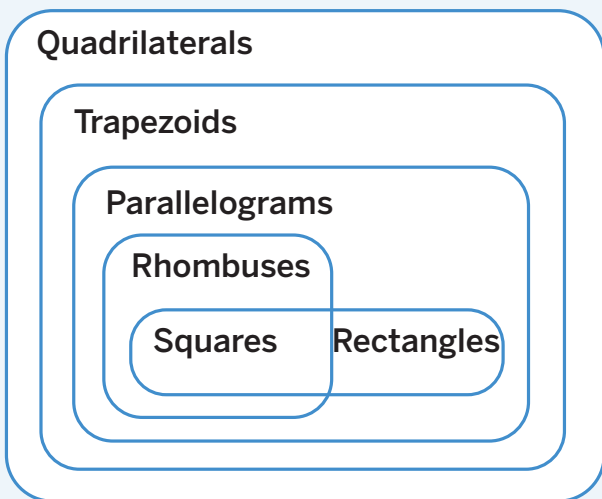
Discuss 

The mystery shape is highlighted. What is the fewest number of questions you would need to ask to determine the mystery shape? What would you ask?



Summary 7.05

The diagram shows how quadrilaterals are related to each other. You can use the diagram to help you figure out all the names of a quadrilateral as well as its most specific name.



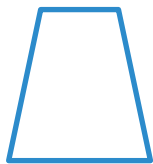
This quadrilateral is a rhombus because it has:

- 2 sets of parallel sides.
- All equal-length sides.

Practice 7.05

1 Which figure does *not* belong?

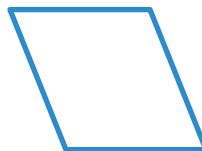
(A)



(B)



(C)




(D)


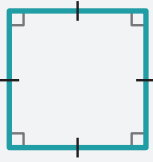
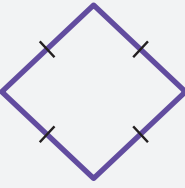


2 Explain why the figure you chose in Problem 1 does *not* belong.

Practice 7.05

Name _____ Date _____

- 3**  Determine which category each quadrilateral belongs to. Select **all** boxes that apply. Shapes may belong to more than one category.

Shape	Square	Rhombus	Trapezoid	Rectangle	Parallelogram
A 					
B 					
C 					

- 4** Choose 1 figure from Problem 3. Determine which name is the most specific for that quadrilateral and explain how you know.

Problem: _____

Spiral Review

For Problems 5–7, evaluate the expression.

 Show your thinking.

5 $\frac{9}{10} - \frac{3}{4}$

answer: _____


6 $3,097 \div 19$

answer: _____

7 18×245

answer: _____

Coordinate Grids

 **Unit Story: Hanan Pacha**



Maykova Galina/Shutterstock.com

How do you think astronomers know where to look in the sky to locate old discoveries and find new ones?

Creating a Coordinate System

Let's describe the locations of points in two-dimensional space.



We are a math community.

How can you critique the work of others in a respectful way?

Warm-Up



eyes on teacher

Activity

1

Describing Location

Hands-On

You will be given a set of 2 cards. Do not show the cards to your partner.

- 1 Describe the location of the point on each card. Be prepared to explain your thinking.

Card A: _____

Card B: _____

1**Describing Location (continued)**

- 2** Combine cards with your partner. Using the information on *both* cards, describe the location of each point as precisely as you can.

Card A: _____

Card B: _____

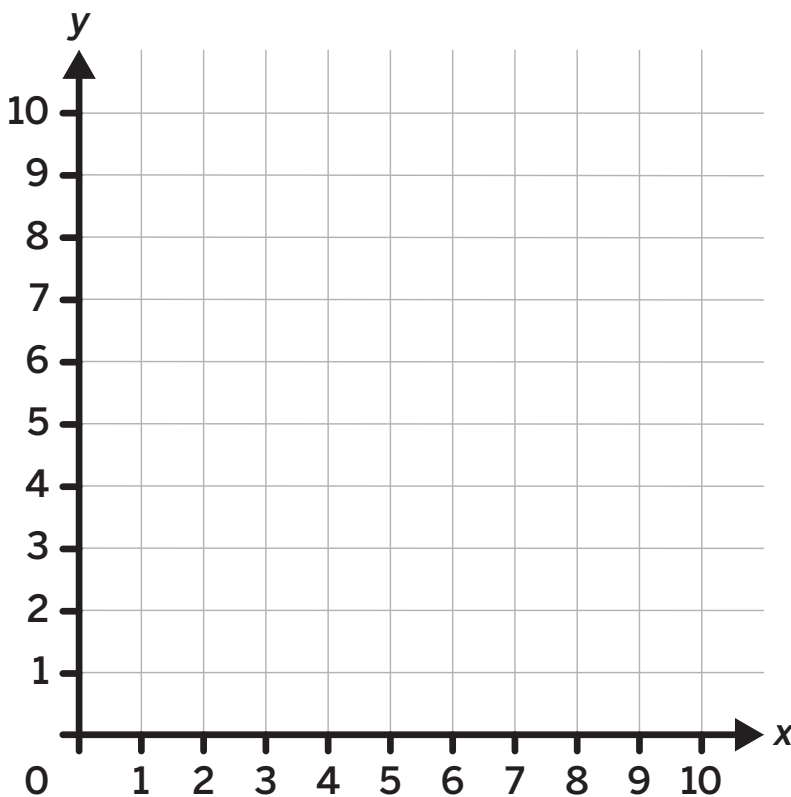
- 3** **Discuss** 

How did having a vertical and a horizontal number line help you describe the location of each point?

Locating Stars

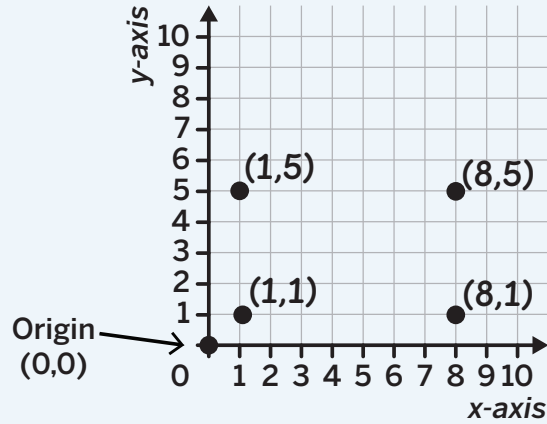
Mia observed some stars. Here are Mia's descriptions of how to spot the 4 brightest stars she observed. Plot and label the location of the stars on the coordinate grid. Each description is based on a starting point of 0.

Description	Star
4 move right 6 units, then up 6 units	<i>Q</i>
5 4 units right, 2 units up	<i>R</i>
6 6 units right, 2 units up	<i>S</i>
7 (1, 10)	<i>T</i>



Summary 7.06

The **coordinate grid** uses **coordinates** to describe the location of points. To describe the location, use the horizontal and vertical distances from the **origin** (0,0) on each **axis**. The **x-axis** is the horizontal axis, and the **y-axis** is the vertical axis.



coordinate A pair of numbers that represent the distance from 0 in two directions, starting on the horizontal axis.

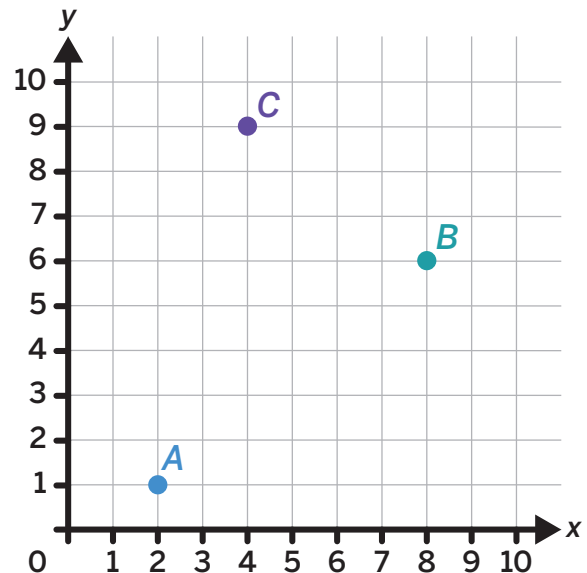
Practice 7.06

For Problems 1–3, describe the location of the point. Be as precise as possible.

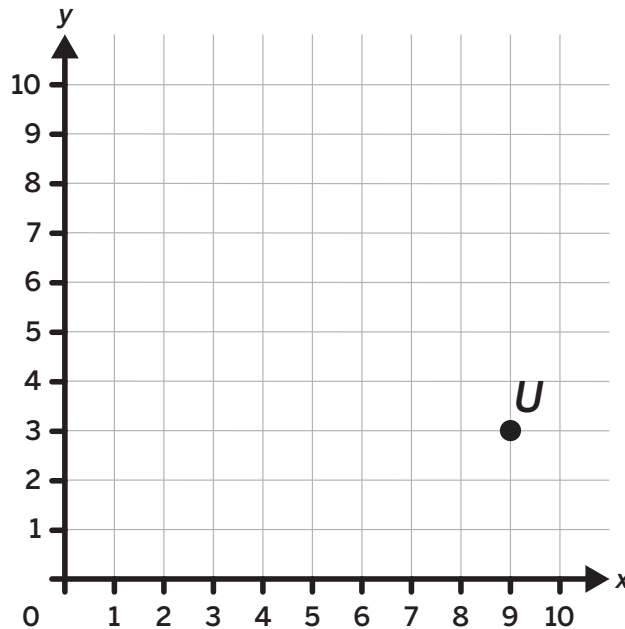
1 point A

2 point B

3 point C



Use the coordinate grid to complete Problems 4–6.



4 Describe the location of point U in 2 different ways.

5 Plot and label the points on the coordinate grid according to the description.

Point	Description
V	8 units to the left of point U
W	1 unit right, 7 units up
X	6 units right, 4 units up
Y	(8, 2)

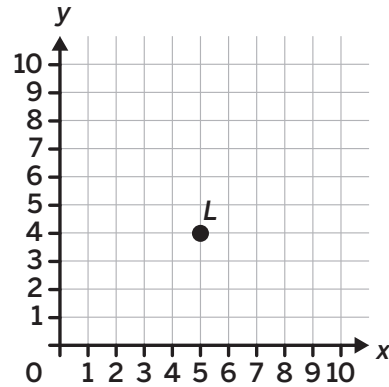
6 Priya says, “Point V is located near 3.” Rewrite her statement to more precisely describe the location of point V .

Practice 7.06

Name _____ Date _____

- 7 Which of the following descriptions describes the location of Point L? Select **all** that apply.

- (A) Start at 0. Move 4 units to the right and then move 5 units up.
- (B) Start at 0. Move 5 units to the right and then move 4 units up.
- (C) (4, 5)
- (D) (5, 4)



Spiral Review

- 8 Which comparison statement is true?

- (A) $16.03 < 16.3$
- (B) $16.013 > 16.301$
- (C) $16.31 < 16.301$
- (D) $16.03 > 16.3$

- 9 Evaluate the expression 380×24 .

i Show your thinking.

answer: _____

Bullseye!

Let's locate points on the coordinate grid.



We are a math community.
How can you share your mathematical ideas as you work today?

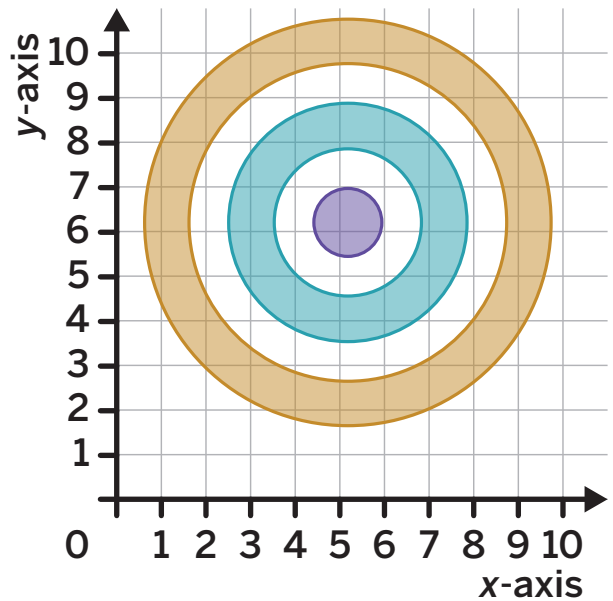
Warm-Up

1 eyes on teacher

Activity

1 Plotting Points

2 Write different ordered pairs that each hit the bullseye.

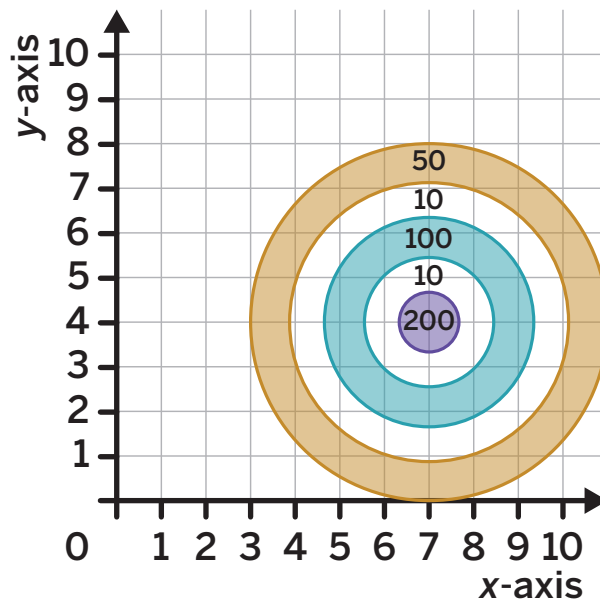


1

Plotting Points (continued)

3

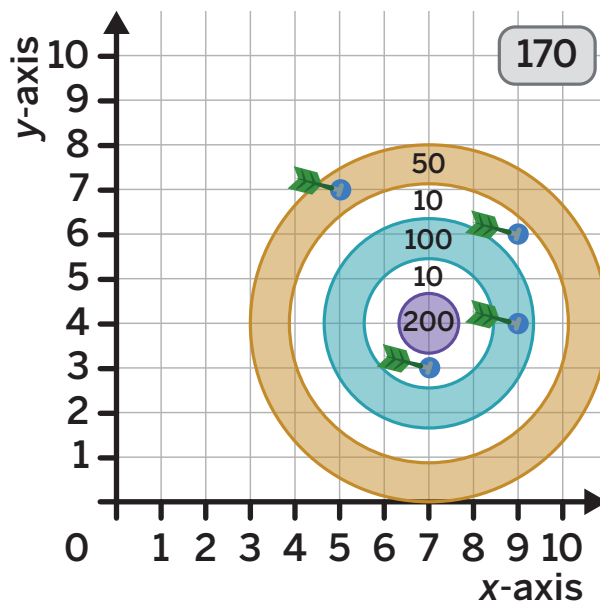
Can you get a score of 400?
Write 4 different ordered pairs that give a total score of 400.



4

Discuss 

How can you determine the ordered pairs of the 4 darts shown?



Challenge Creator

5

Choose Dartboard A or B to create your own challenge.

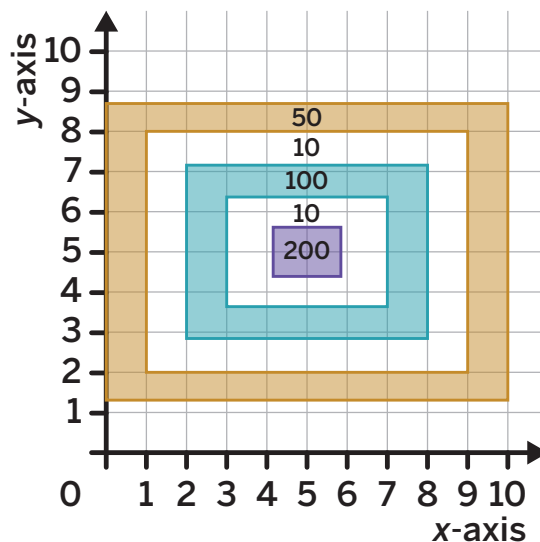
- Choose how many darts your partner will be able to use: 1, 2, 3, or 4.
- Choose a target score for your dartboard.
- Switch books with your partner.
- List ordered pairs that will get you to your partner's target score.

Dartboard A

Number of darts: _____

Target score: _____

Ordered pairs: _____

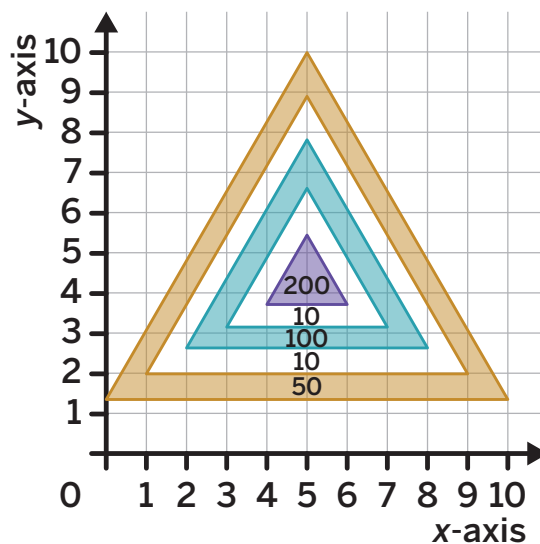


Dartboard B

Number of darts: _____

Target score: _____

Ordered pairs: _____

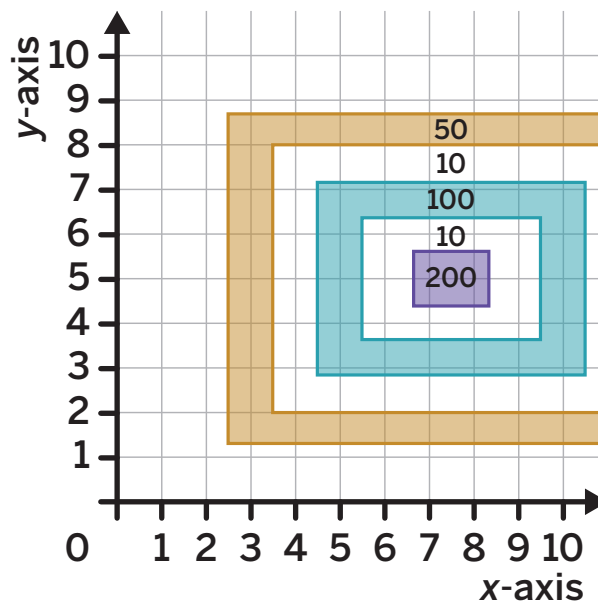


Challenge Creator (continued)

6

Priya is aiming for a total score of 450 using 4 darts. She has thrown 3 darts. Write an ordered pair so she can get a total score of 450.

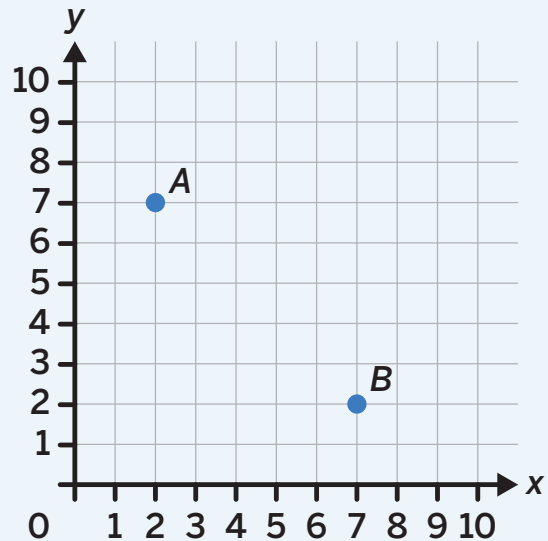
Ordered pairs
(5.5, 3)
(7, 5)
(10, 6.5)



Summary 7.07

In an **ordered pair** (x, y) , the first number is the **x-coordinate** and it represents how far to move horizontally on the x-axis. The second number is the **y-coordinate** and it represents how far to move vertically on the y-axis.


Point A is located at $(2, 7)$, and point B is located at $(7, 2)$.




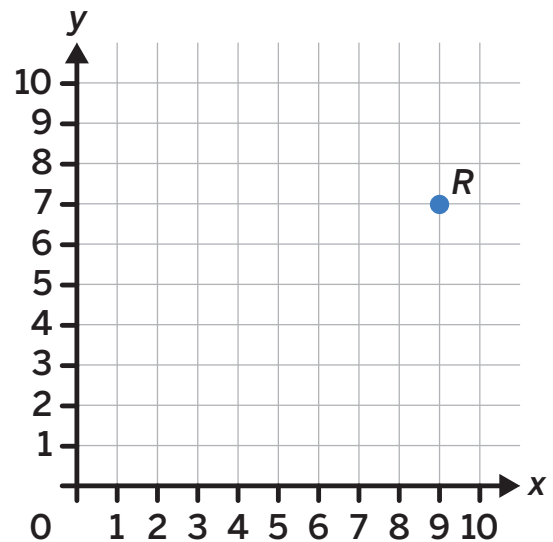
ordered pair A pair of 2 numbers that correspond to points on the x- and y-axis, expressed as (x, y) .

Practice 7.07

Use the coordinate grid for Problems 1 and 2.

- 1  What are the coordinates of point R?

- 2  Plot and label point S at $(1, 3)$ and point T at $(3, 1)$.
- 3 Describe how you could plot the point $(6, 5\frac{1}{2})$ on the coordinate grid.

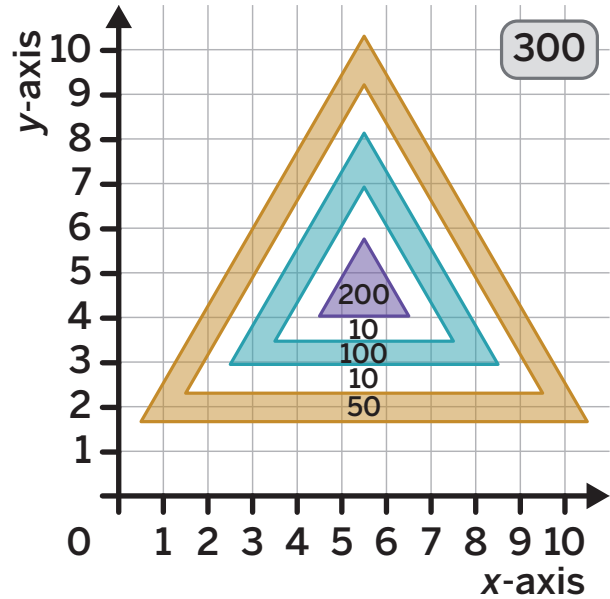


Practice 7.07

Name _____ Date _____

- 4 Priya is aiming for a total score of 300 using 4 darts. She has thrown 3 darts. Write an ordered pair so she can get a total score of 300.

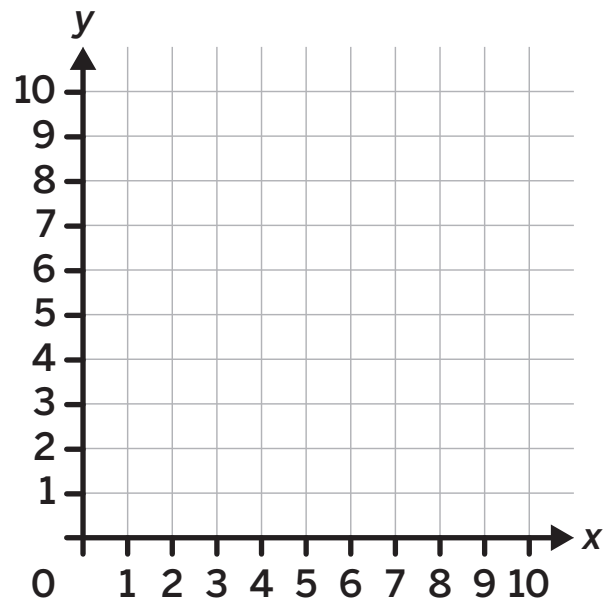
Ordered pairs
(6, 2)
(6, 3)
(2, 2)



Use the coordinate grid for Problems 5 and 6.

- 5 Create a design on the coordinate grid with at least 10 points.

- 6 List *all* the coordinates of the design that you made.



Spiral Review

For Problems 7–10, evaluate the expression.

 Show your thinking.

7 $12.7 + 3.84$

answer: _____

8 $1\frac{4}{5} + 2\frac{3}{4}$

answer: _____

9 37×16

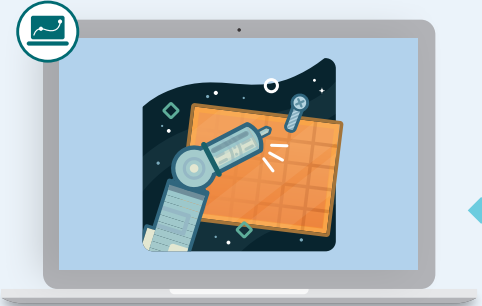
answer: _____

10 42×72

answer: _____

Coordinating Satellite Repairs

Let's plot more points and write ordered pairs to notice patterns.



Warm-Up

1

eyes on teacher



I can be all of me in math class.

Think of a time when you felt nervous about sharing. What would help you feel comfortable?

Activity

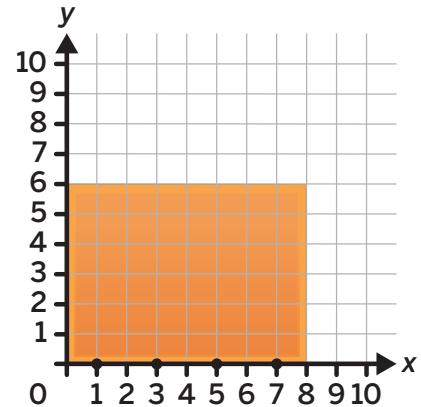
1

Plotting Points on Lines

Help repair the satellite panel. Write the ordered pair of each hole on the coordinate grid.

2

(,)
(,)
(,)
(,)



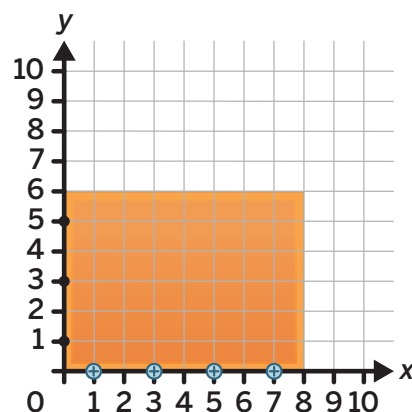
1

Plotting Points on Lines (continued)

Help repair the satellite panel. Write the ordered pair of each hole on the coordinate grid.

3

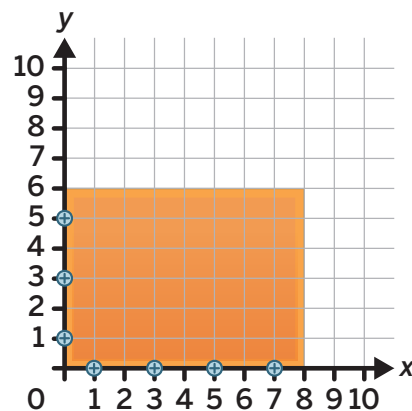
(,)
(,)
(,)



4

Explain 

What is the same about the ordered pairs for the points on the x-axis and the points on the y-axis? Why does that make sense?



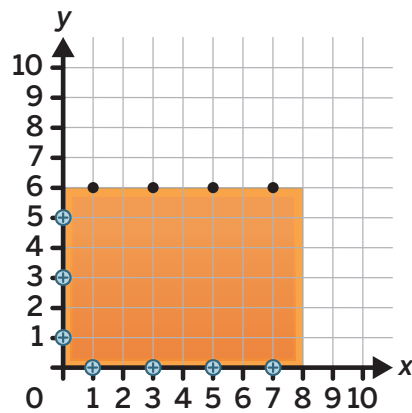
1

Plotting Points on Lines (continued)

Write the ordered pair of each hole on the coordinate grid.

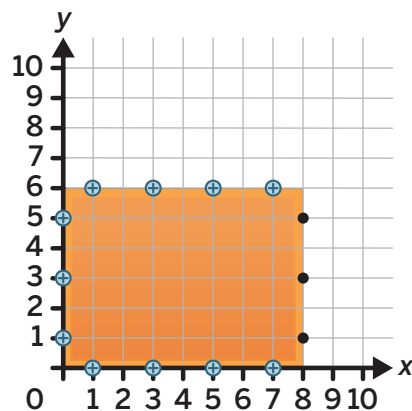
5

(,)
(,)
(,)
(,)



6

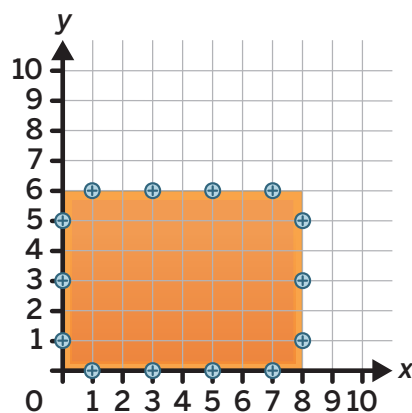
(,)
(,)
(,)



7

Explain 

What conclusions could you make about the ordered pairs on any horizontal line? On any vertical line?



2

Building Satellite Panels

8

Think-Pair-Share 

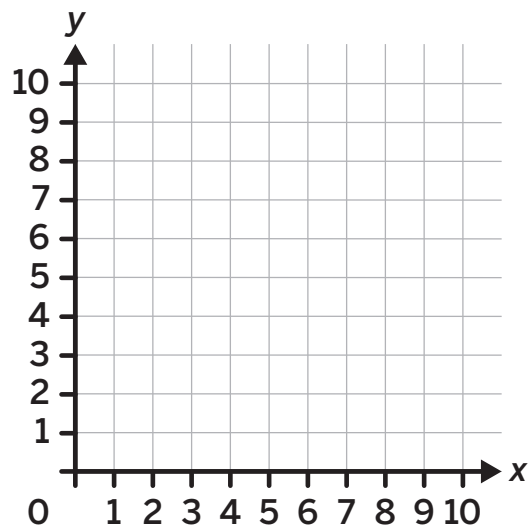
Let's consider a draggable rectangle on a coordinate grid.

What do you notice about the rectangle's corners and the ordered pairs in the table?

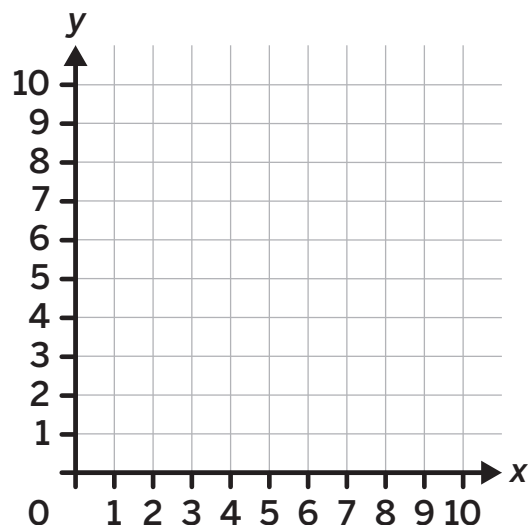
9

Plot the ordered pairs to build rectangles representing the different satellite panels that need repair. Complete as many challenges as you have time for.

(2, 3)
(6, 7)
(2, 7)
(6, 3)



(0, 4)
(3, 0)
(0, 0)
(3, 4)



2

Building Satellite Panels (continued)

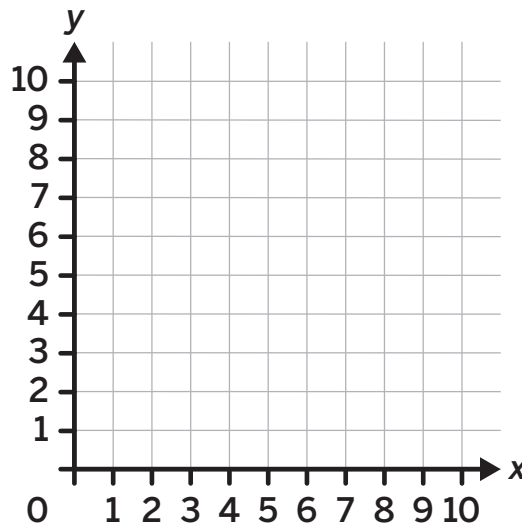
9

(4, 5)

(0, 9)

(4, 9)

(0, 5)

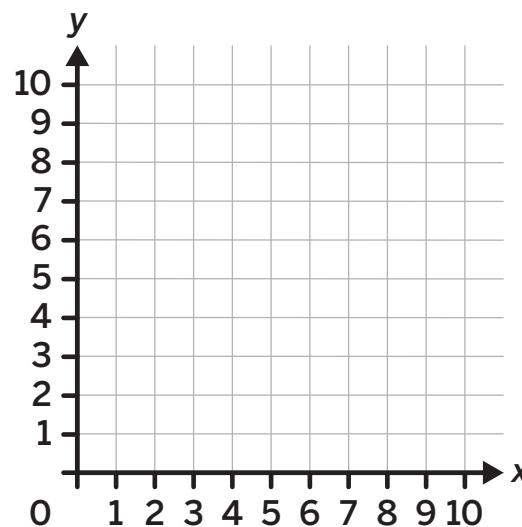


(1, 4)

(8, 7)

(1, 7)

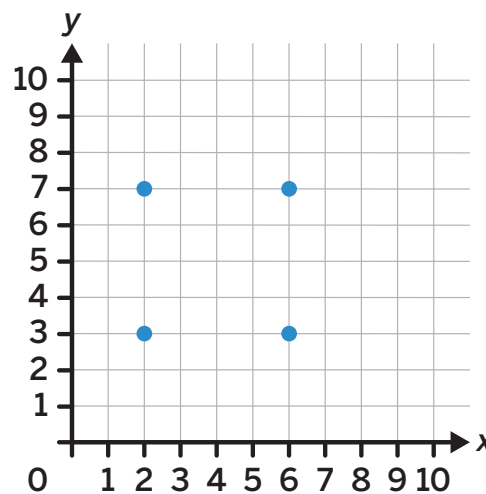
(8, 4)



10

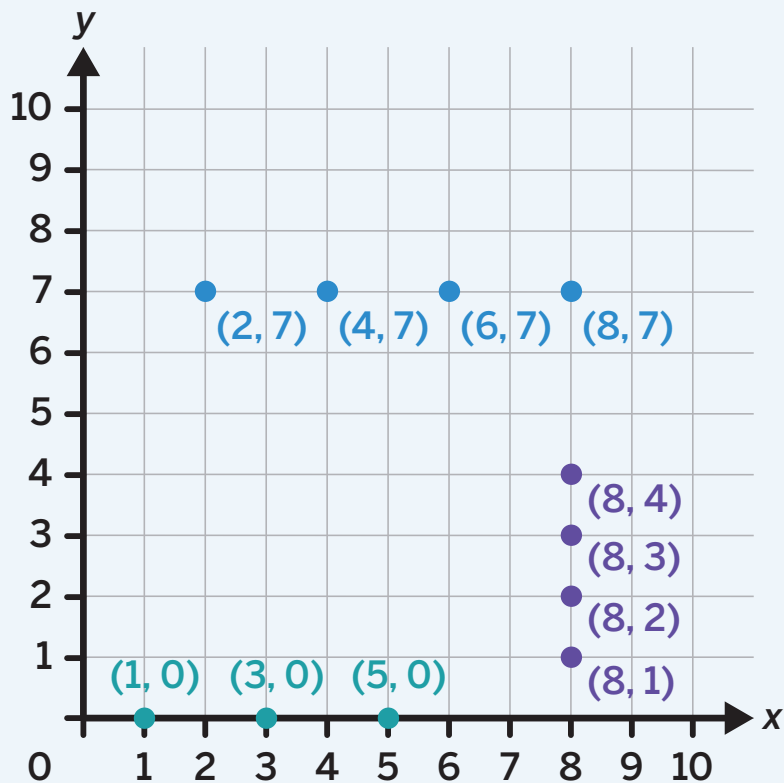
Explain 

What is the least amount of information you need to build a rectangle on a coordinate grid?



Summary 7.08

If the x -coordinate is the same in a set of ordered pairs, those points fall on a vertical line. If the y -coordinate is the same in a set of ordered pairs, those points fall on a horizontal line.



Practice 7.08

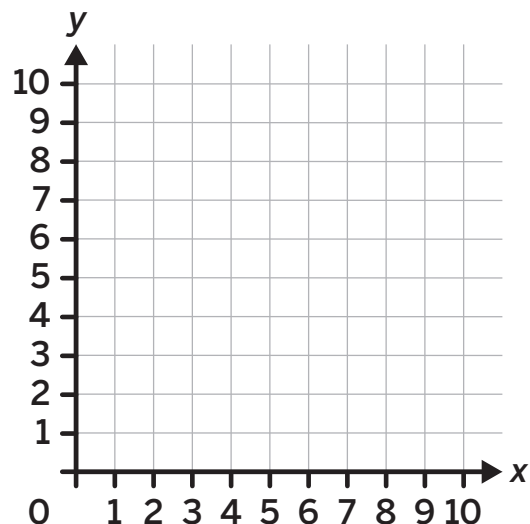
- 1 Fill in the blanks with 4 different numbers between 0 and 10 and plot the points on the coordinate grid.

(_____ , 0)

(_____ , 0)

(_____ , 0)

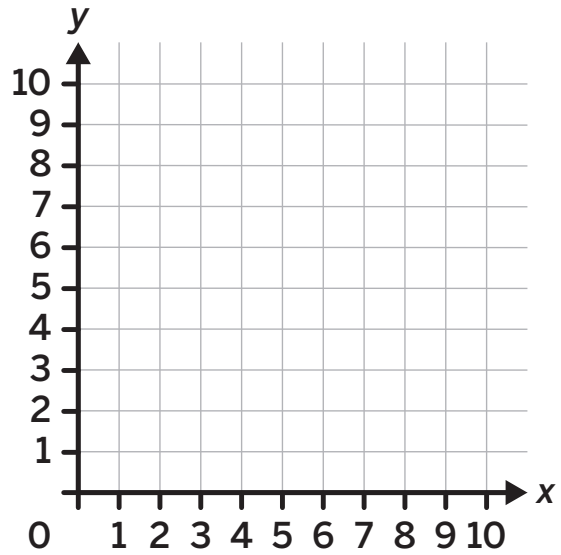
(_____ , 0)



Use the coordinate grid for Problems 2–4.

- 2  Plot and label the points on the coordinate grid.

Point	Ordered pair
<i>A</i>	(1, 1)
<i>B</i>	(2, 2)
<i>C</i>	(3, 3)
<i>D</i>	(4, 4)



- 3 What do you notice about the points?

- 4 If this pattern continued, would a point be located at (7, 9)? Explain your thinking.

Spiral Review

For Problems 5–8, evaluate the expression.

 Show your thinking.

5 $8.3 - 6.84$

answer: _____

6 $4\frac{1}{4} - 1\frac{3}{8}$

answer: _____

7 $936 \div 12$

answer: _____

8 31×24

answer: _____

Numerical Patterns

✦ Unit Story: Hanan Pacha



leftyphoto/Shutterstock.com

Where do you see patterns in your everyday life?

Generating Patterns

Let's explore how mathematical rules can generate patterns and relationships.



Warm-Up



eyes on teacher



I am a doer of math.

How and when do you use math outside of the classroom?

Activity

1

Comparing 2 Patterns

Use the rules to complete each table.

Set A

- Write the first 10 numbers for each rule.

Rule 1: Start with 0 and keep adding 4.

--	--	--	--	--	--	--	--	--	--

Rule 2: Start with 0 and keep adding 8.

--	--	--	--	--	--	--	--	--	--

Comparing 2 Patterns (continued)

2 What are different ways you can describe the relationship between the numbers in Rule 1 and Rule 2?

 Show or explain your thinking.



More Patterns

Use the rules to complete each table.

Set B

- 3 Write the first 10 numbers for each rule.

Rule 1: Start at 0 and keep adding 2.

--	--	--	--	--	--	--	--	--	--

Rule 2: Start at 0 and keep adding 3.

--	--	--	--	--	--	--	--	--	--

- 4 Use multiplication to describe the relationship between the numbers in Rule 1 and Rule 2.



Show or explain your thinking.

More Patterns (continued)**Set C**

- 5 Write the first 10 numbers for each rule.

Rule 1: Start at 0 and keep adding 5.

--	--	--	--	--	--	--	--	--	--

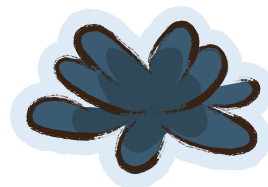
Rule 2: Start at 0 and keep adding 3.

--	--	--	--	--	--	--	--	--	--

- 6 Use multiplication to describe the relationship between the numbers in Rule 1 and Rule 2.



Show or explain your thinking.



Summary 7.09

You can use 2 rules to generate a pattern that has a relationship between corresponding terms. You can describe that relationship in different ways.


Rule 1: Start at 0 and keep adding 4.

Rule 2: Start at 0 and keep adding 2.

Rule 1	0	4	8	12	16
Rule 2	0	2	4	6	8

- Each term in Rule 2 is $\frac{1}{2}$ as much as the corresponding term in Rule 1.
- You can divide each number in Rule 1 by 2 to get the corresponding term in Rule 2.
- You can multiply each number in Rule 1 by $\frac{1}{2}$ to get the corresponding term in Rule 2.

Practice 7.09

- 1  Write the first 5 numbers for each rule.

Rule 1: Start with 0 and keep adding 10.

Rule 2: Start with 0 and keep adding 5.

Rule 1					
Rule 2					

- 2 Describe the relationship between corresponding terms for the 2 rules.

Practice 7.09

Name _____ Date _____

- 3 Write the first 10 numbers for each rule.

Rule 1: Start with 0 and keep adding 5.

Rule 2: Start with 0 and keep adding 10.

Rule 1										
Rule 2										

Use the table in Problem 3 for Problems 4 and 5.

- 4 If the patterns from Problem 3 continue, what number will be the corresponding term for Rule 1 when the number for Rule 2 is 130?

- 5 Describe the relationship between corresponding terms for the 2 rules.

- 6 The table shows 2 patterns generated from 2 rules. Describe the relationship between corresponding terms for the 2 rules using multiplication.

Rule 1	0	14	28	42	56
Rule 2	0	2	4	6	8

Spiral Review

For Problems 7–9, evaluate the expression.

 Show your thinking.

7 $5\frac{1}{3} + 1\frac{4}{5}$

answer: _____

8 $6\frac{3}{8} - 5\frac{3}{10}$

answer: _____

9 422×32

answer: _____

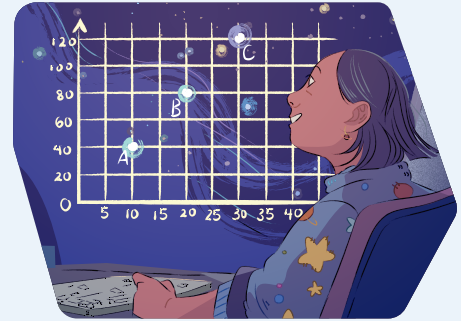
For Problems 10 and 11, evaluate the expression.

10 $4 \times 5 - (6 \times 3)$

11 $(15 + 3) - 5$

Representing Relationships

Let's compare different ways to describe relationships between patterns.



Warm-Up



eyes on teacher



I can be all of me in math class.

Mia discovered a love of all the stars. What have you discovered about yourself this year?

Activity

1

Patterns on the Coordinate Grid

You and your partner will each be given a handout. Partner A will complete Problems 1 and 2. Partner B will complete Problems 3 and 4.

1 Discuss

- Compare your graphs. What is similar? What is different?
- How can you describe the relationship between corresponding terms in Set A? In Set B?



Card Sort: Matching Relationships

Hands-On

You and your partner will be given a set of cards. Each card represents a pattern generated by 2 rules using a graph, table, or description.

2 Sort

Match the cards that represent the same pattern. Record the matches in the table. Be prepared to share your thinking.

Graph	Table	Description

3 Discuss

Join another pair. Share and compare your matches. How do you know your matching cards represent the same relationship?

Summary 7.10

The relationship between 2 patterns can be represented in different ways.

Rules:

Rule 1: Start with 0 and keep adding 1.

Rule 2: Start with 0 and keep adding 2.

Graph:

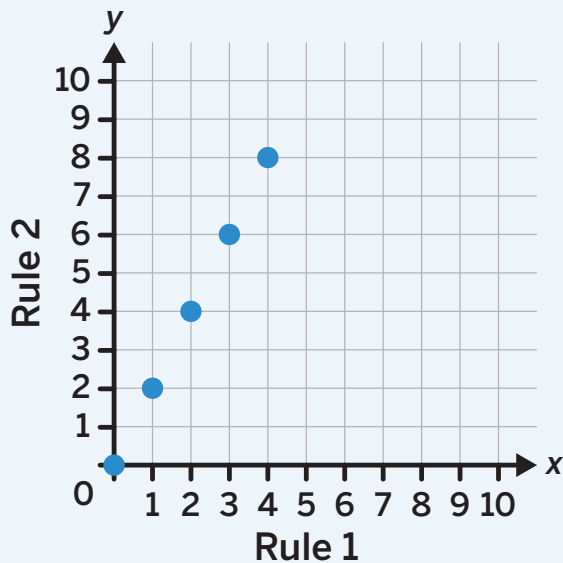


Table:

Rule 1	0	1	2	3	4
Rule 2	0	2	4	6	8

Description about corresponding terms:

Each term in Rule 2 is 2 times the corresponding term in Rule 1.

Practice 7.10

- 1 The table shows 2 rules. Which statement is true based on the table?

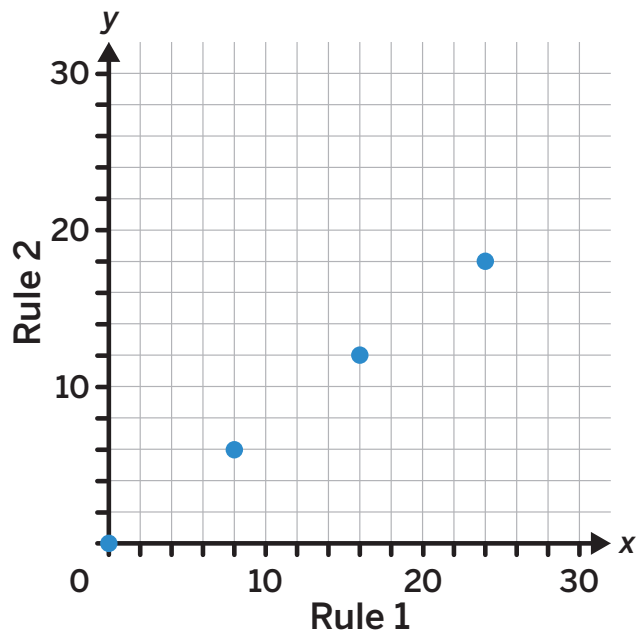
Rule 1	0	5	10	15	20	25
Rule 2	0	3	6	9	12	15

- (A) Each term in Rule 1 is 2 times the corresponding term in Rule 2.
- (B) Each term in Rule 1 is $\frac{1}{3}$ the corresponding term in Rule 2.
- (C) Each term in Rule 2 is $\frac{3}{5}$ the corresponding term in Rule 1.
- (D) Each term in Rule 2 is $\frac{5}{3}$ the corresponding term in Rule 1.

Practice 7.10

Name _____ Date _____

The graph shows the first 5 points that represent 2 patterns generated from 2 different rules. Use the graph for Problems 2–4.



2 Complete the table using the coordinates from the graph.

Rule 1				
Rule 2				

For Problems 3 and 4, decide whether each statement about the graph is *true* or *false*. For each false statement, rewrite it so that it is true.

3 Each number in Rule 2 is $\frac{8}{6}$ the corresponding term in Rule 1.

4 If the patterns continue, the point (60, 80) will be on the graph.

Spiral Review

- 5 Represent 28 as a multiplication expression using only its prime factors.

 Show or explain your thinking.

answer: _____

For Problems 6 and 7, evaluate the expression.

 Show your thinking.

6 $5.82 + 6.59$

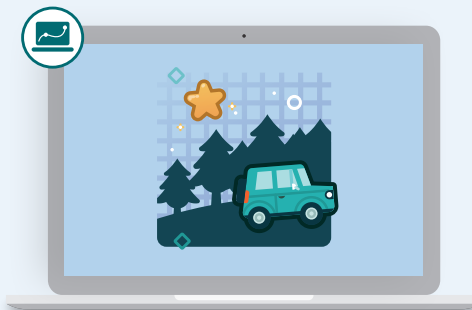
answer: _____

7 $12.41 - 7.8$

answer: _____

Seeing Stars

Let's use points on the coordinate grid to represent contexts.



I am a doer of math.
Analyzing errors can help you learn. Why do you think that is?

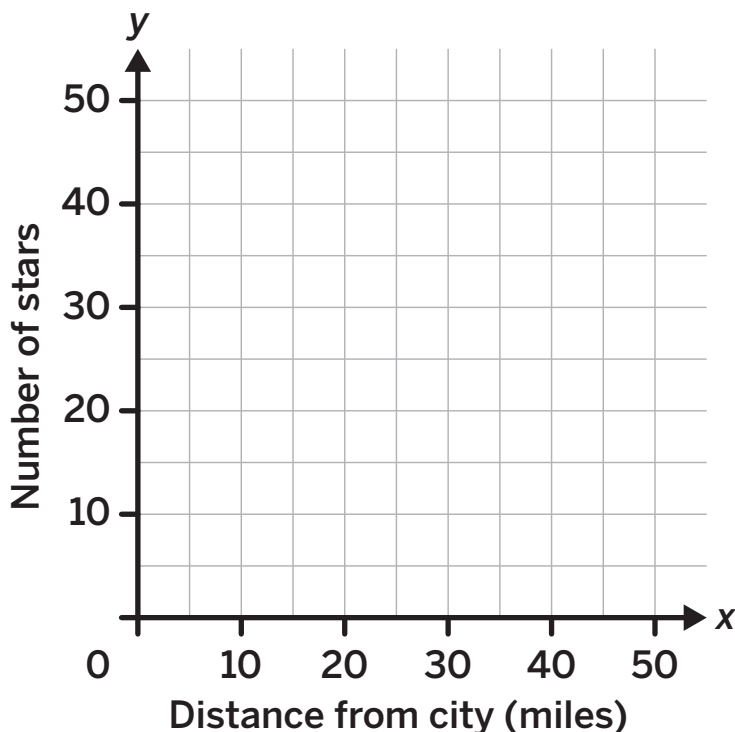
Warm-Up

1 eyes on teacher

Activity

1 Mia, Mia, What Do You See?

2 Mia traveled 35 miles away from the city and observed 45 stars through her telescope. Plot a point that represents the situation.

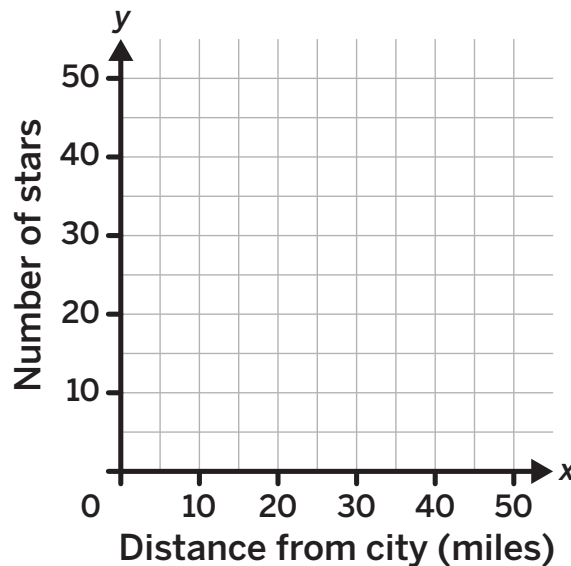


1

Mia, Mia, What Do You See? (continued)

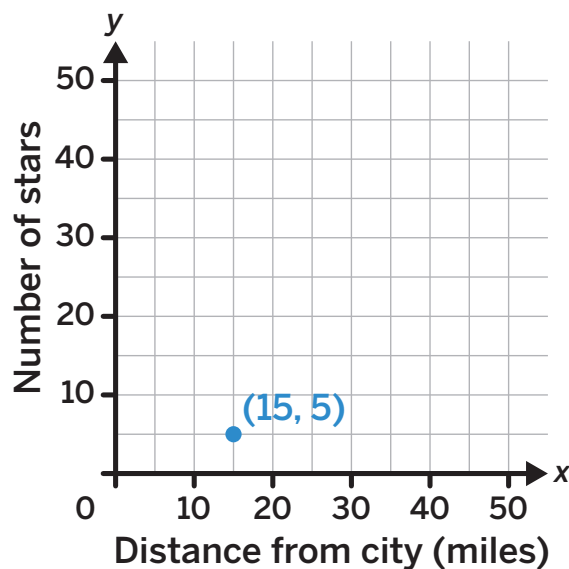
3

Mia observed 27 stars through her telescope 16 miles away from the city. Write the ordered pair that represents this situation.



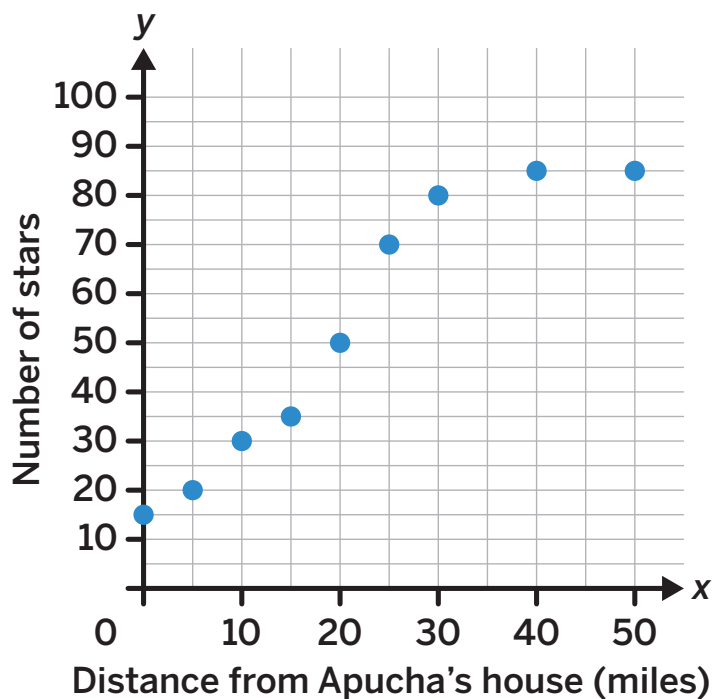
4

What does the point (15, 5) mean on this graph?



A Star-Studded Night

When Mia visited her Apucha in Chile, she wondered how many stars she would see as she went farther from her Apucha's house. Use the graph for Screens 5 and 6.

**5****Data Talk!**

What is one thing you know based on the points on the graph?

6

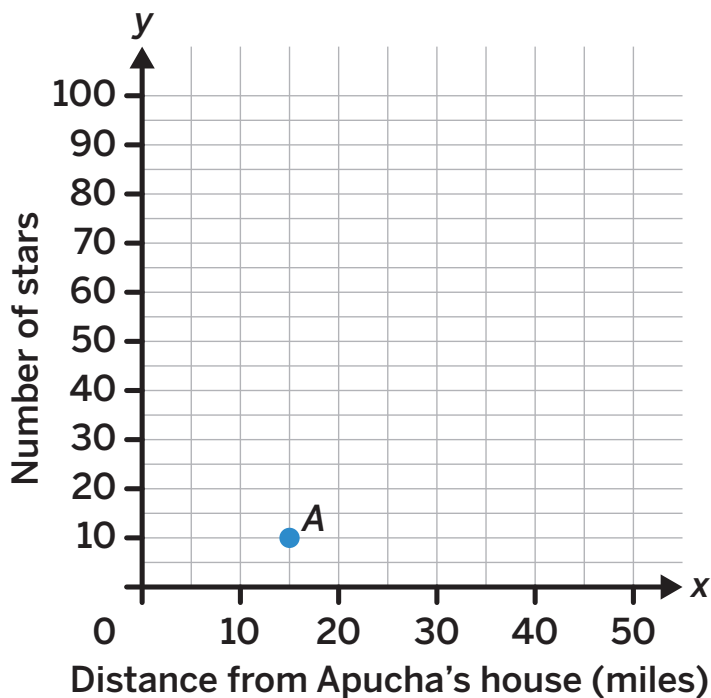
How far away from her Apucha's house was Mia when she observed 20 stars?

A Star-Studded Night (continued)

7

Mia went on a road trip from her Apucha's house. Point A represents Mia's first stop. She then went 20 miles farther and saw 35 stars.

Write an ordered pair to represent where Mia is now.



8

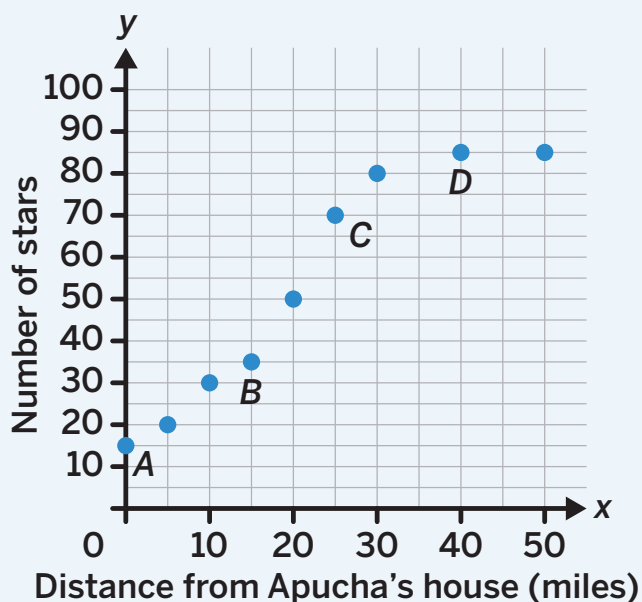
Explain 

Let's look at some points that other students plotted.

Which point is correct? Which points are incorrect? How do you know?

Summary 7.11

You can use the coordinate grid to represent and interpret data about a context. The ordered pairs represent the relationship between the information represented on each axis.

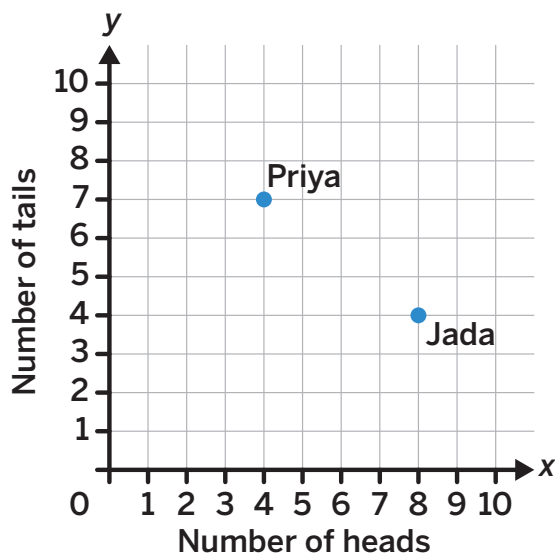


What does point C represent on the graph?

Mia observed 70 stars 25 miles from Apucha's house.

Practice 7.11

The points on the graph show Jada's and Priya's results from when they tossed a coin. Use the graph for Problems 1 and 2.



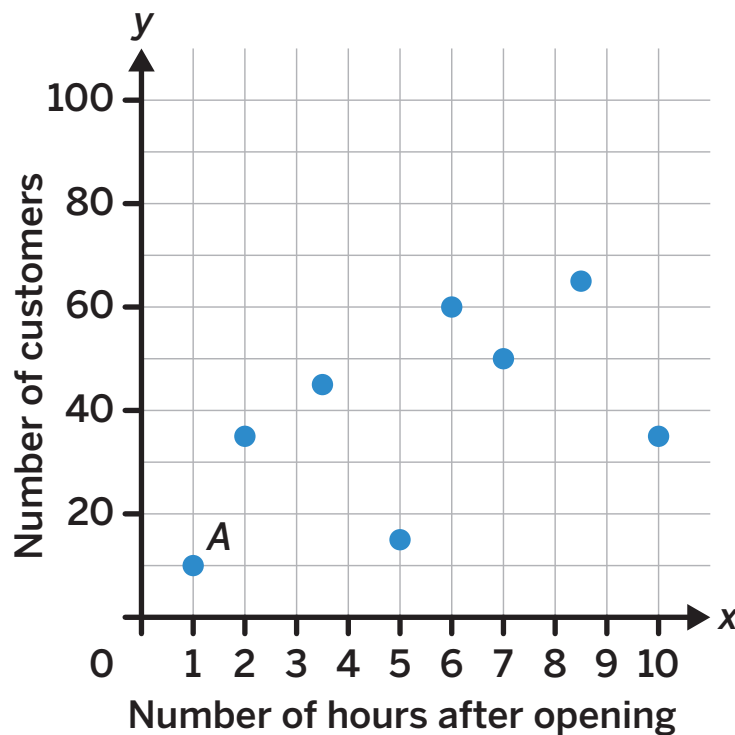
Practice 7.11

Name _____ Date _____

1 Who tossed the coin more times? Explain your thinking.

2 Who got more tails? Explain your thinking.

The graph shows the number of customers in a grocery store at different times after opening one day. Use the graph for Problems 3–5.



3 What does the ordered pair of point A represent in this context?

Practice 7.11

Name _____ Date _____

4  Plot a point on the coordinate grid to show that 50 people were in the store 9 hours after opening. Label the point with its ordered pair.

5 Describe how you could plot the point $(3.5, 8)$ on a coordinate grid.

Spiral Review

6 Which comparison statement is true?

(A) $8.019 > 8.09$

(B) $8.19 < 8.1$

(C) $8.91 > 8.912$

(D) $8.019 < 8.1$

For Problems 7 and 8, evaluate the expression.

 Show your thinking.

7 409×18

8 $630 \div 18$

answer: _____

answer: _____

Stones and Stars

Let's look at what a graph can show us about mathematical relationships.



Warm-Up



eyes on teacher



I am a doer of math.

How can you look beyond what you see to uncover the *why* behind it?

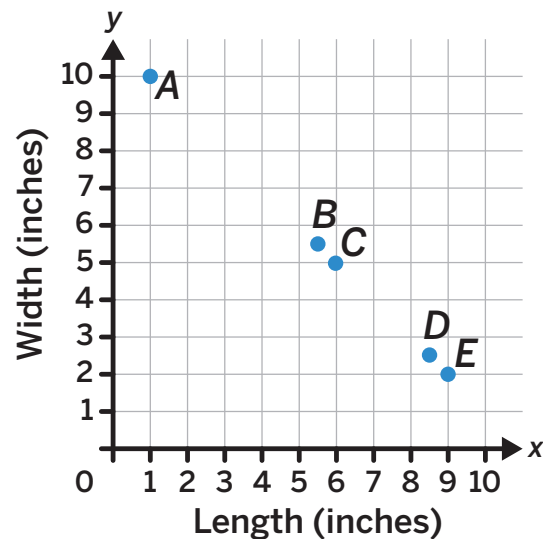
Activity

1

A Stone-y Night

Mia remembers a visit with her Apucha when her family collected stones to build a fire pit. She noticed that many of the stones had outer faces that were rectangles. The points on the graph represent lengths and widths of some stones' outer faces.

State whether you *agree* or *disagree* with each statement about the graph. Explain your thinking.



1 Point B represents a stone that has a square face.

1**A Stone-y Night (continued)**

- 2 Point D represents a stone whose face is wider than it is long.

- 3 Points A and E represent rectangles that have the same area.

- 4 Points A and E represent rectangles with the same perimeter.

- 5 Plot 1 more point on the graph and label it F . Create your own statement similar to Problems 1–4.

- 6 **Discuss** 

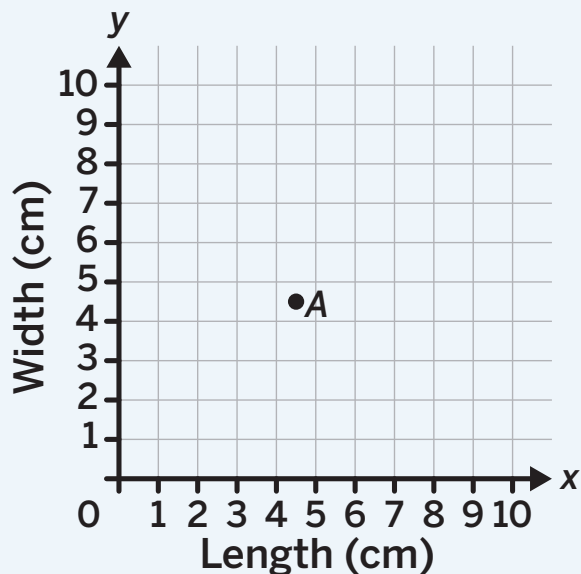
Share your point and statement from Problem 5 with another pair. Do they agree or disagree? Why? Are they correct?

Summary 7.12

You can interpret the information represented on a coordinate grid by looking for a relationship between the points.

Point A represents the length and width of a rectangle. Is the rectangle a square? How do you know?

The length and width are $4\frac{1}{2}$ centimeters. Because all sides are equal in length, it is a square.

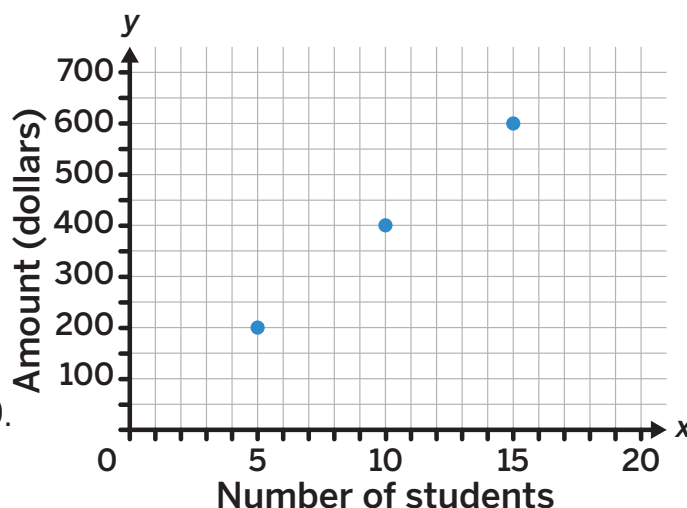


Practice 7.12

The graph shows the amount of money raised by students during their school's holiday drive. Use the graph for Problems 1–4.

- 1 Which statements are true about the graph? Select **all** that apply.

- \$200 was raised by 5 students.
- 200 students raised \$5.
- If the pattern continues, 20 students can raise \$900.
- If every student raised the same amount of money, then each student raised \$40.



Explain why each statement about the graph is true.

2 Each group of 5 students raised the same amount of money as the first group of 5 students.

3 If the fundraising goal is \$2,000 and the pattern continues, then 50 students will need to raise funds.

4 If each student raises the same amount of money, then the point (23, 920) will be on the graph.

Spiral Review

- 5 Which statements about the relationship between corresponding terms in Rule 1 and Rule 2 are true? Select *all* that apply.

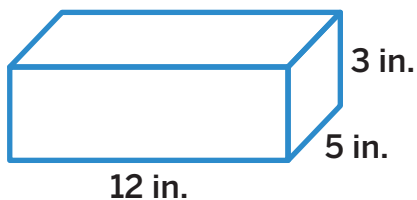
Rule 1	4	8	12	16	20
Rule 2	1	2	3	4	5

- (A) Each term in Rule 1 is 2 times the corresponding term in Rule 2.
- (B) Each term in Rule 2 is $\frac{1}{4}$ the corresponding term in Rule 1.
- (C) Each term in Rule 1 is $\frac{1}{4}$ the corresponding term in Rule 2.
- (D) Each term in Rule 1 is 4 times the corresponding term in Rule 2.
- 6 Which comparison statement is true?
- (A) $0.074 > 0.74$
- (B) $0.74 > 0.47$
- (C) $0.407 > 0.704$
- (D) $0.7 > 0.704$

For Problems 7 and 8, determine the volume of the rectangular prism.

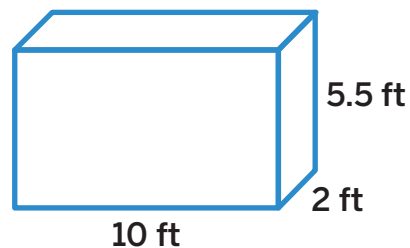
 Show your thinking.

7



answer: _____

8

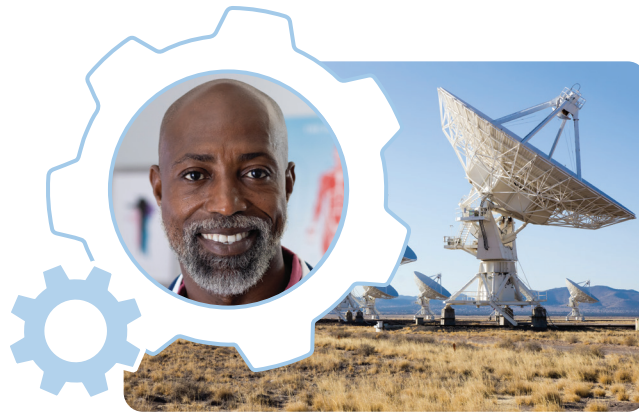


answer: _____

Math at Work

Have you ever looked at the night sky through a telescope? Imagine what you might see if you could use 27 telescopes at one time! The VLA (Very Large Array) is a telescope facility in New Mexico that consists of 27 radio telescopes, plus 1 spare. The telescopes are arranged in a “Y” shape to see more detail in space – the wider the array, the more it can see.

Astronomers study objects in space, such as stars, planets, and galaxies. They use telescopes and a coordinate system called the *equatorial coordinate system*, which maps the sky on a spherical grid instead of a rectangular grid.



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Math in the World

One of the most famous groups of stars in the Northern Hemisphere is the Big Dipper. What math words can you use to describe the shape you see?



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Math Mindset

What are some different ways to describe the location of point A?

