EUREKA MATH PUSD

A Story of Units

Pleasanton Unified School District Mathematics Curriculum

GRADE 5 • MODULE 6

Problem Solving with the Coordinate Plane

Homework

Video tutorials: http://bit.ly/eurekapusd
Info for parents: http://bit.ly/pusdmath

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GRADE 5 • MODULE 6

Problem Solving with the Coordinate Plane

NOTE: Student sheets should be printed at 100% scale to preserve the intended size of figures for accurate measurements. Adjust copier or printer settings to *actual size* and set page scaling to *none*.

Name ____ Date ______________________

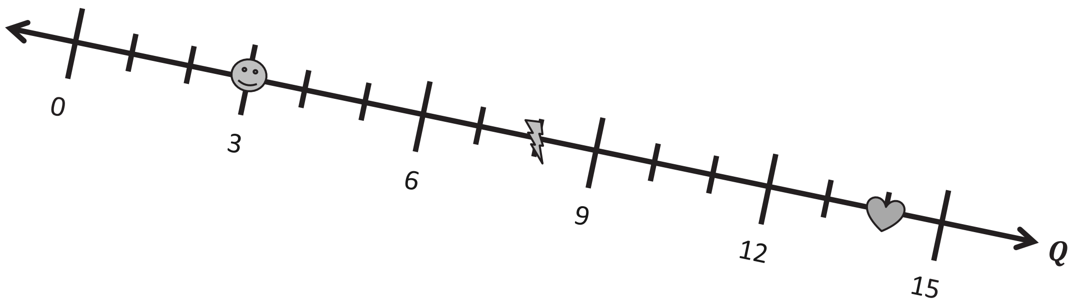
1. Answer the following questions using number line $\boldsymbol{Q}$, below.

   a. What is the coordinate, or the distance from the origin, of the  ? ______________

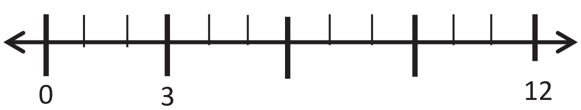
   b. What is the coordinate of  ? ______________

   c. What is the coordinate of  ? ______________

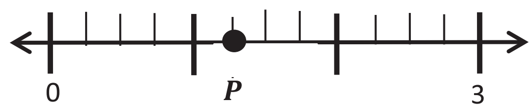
   d. What is the coordinate at the midpoint of  and  ? ______________



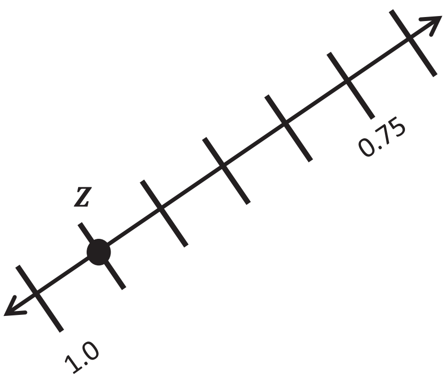
2. Use the number lines to answer the questions.



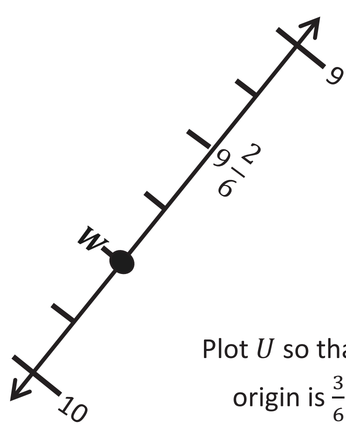
Plot T so that its distance from the origin is 10.



Plot M so that its distance is $\frac{11}{4}$ from the origin. What is the distance from P to M?

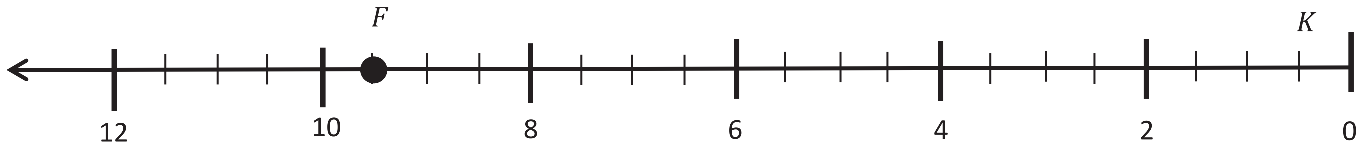


Plot a point that is 0.15 closer to the origin than Z.



Plot U so that its distance from the origin is $\frac{3}{6}$ less than that of W.

3. Number line $\boldsymbol{K}$ shows 12 units. Use number line $\boldsymbol{K}$, below, to answer the questions.



a. Plot a point at 1. Label it A.

b. Label a point that lies at $3\frac{1}{2}$ as B.

c. Label a point, C, whose distance from zero is 8 units farther than that of B.

The coordinate of C is __________.

d. Plot a point, D, whose distance from zero is $\frac{6}{2}$ less than that of B.

The coordinate of D is __________.

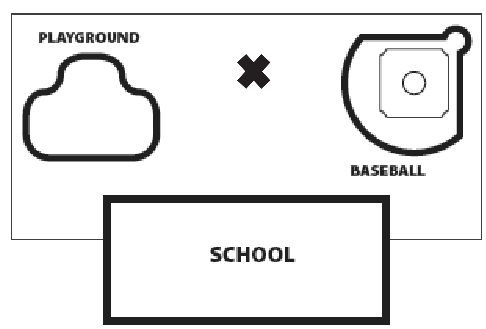
e. What is the coordinate of the point that lies $\frac{17}{2}$ farther from the origin than D?

Label this point E.

f. What is the coordinate of the point that lies halfway between F and D?

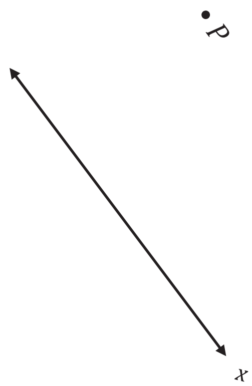
Label this point G.

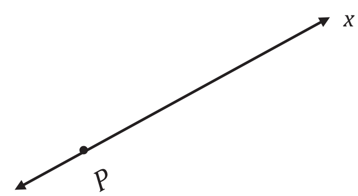
4. Mr. Baker's fifth-grade class buried a time capsule in the field behind the school. They drew a map and marked the location of the capsule with an ✖ so that his class can dig it up in ten years. What could Mr. Baker's class have done to make the capsule easier to find?



Name ____ Date ____________________

1. a. Use a set square to draw a line perpendicular to the x-axis through point P. Label the new line as the y-axis.





   b. Choose one of the sets of perpendicular lines above and create a coordinate plane. Mark 5 units on each axis, and label them as whole numbers.

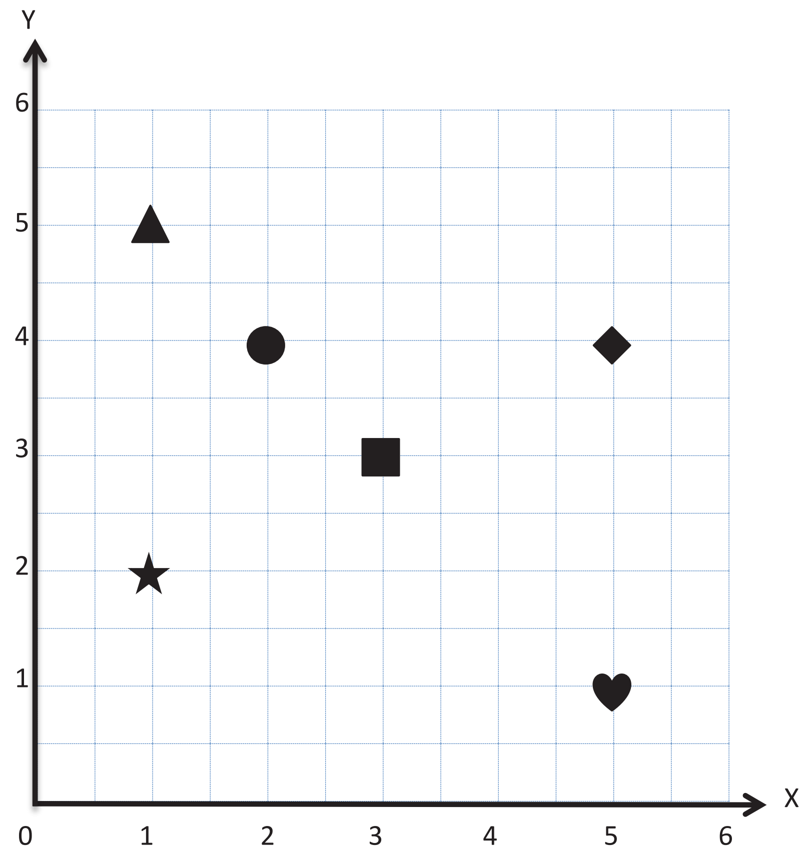
2. Use the coordinate plane to answer the following.

   a. Name the shape at each location.

x-coordinate	y-coordinate	Shape
2	4	
5	4	
1	5	
5	1	

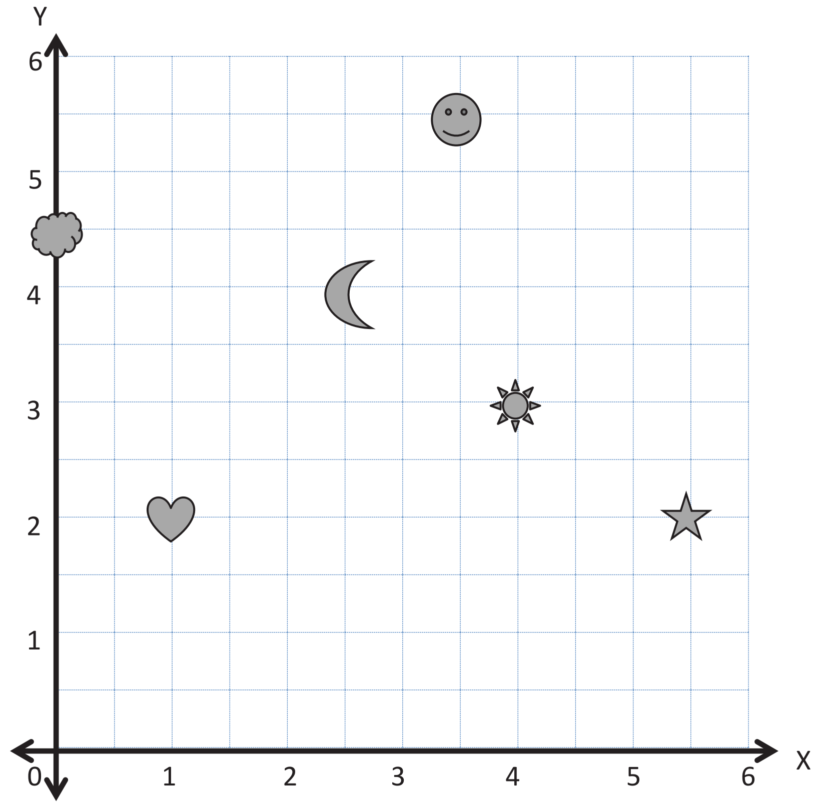
   b. Which shape is 2 units from the x-axis?

   c. Which shape has the same x- and y-coordinate?



3. Use the coordinate plane to answer the following.
   a. Name the coordinates of each shape.

Shape	**x-coordinate**	**y-coordinate**
Moon		
Sun		
Heart		
Cloud		
Smiley Face		



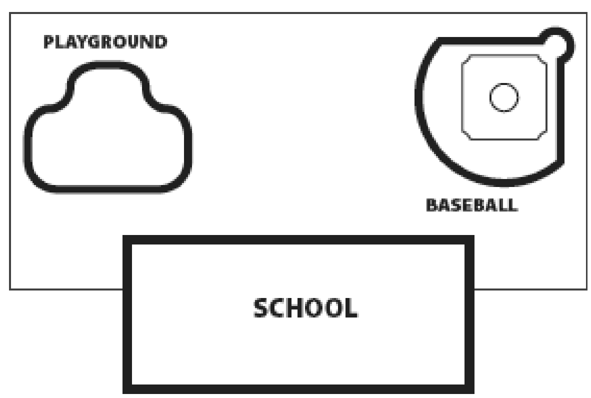
   b. Which 2 shapes have the same y-coordinate?

   c. Plot an X at (2, 3).

   d. Plot a square at $(3, 2\frac{1}{2})$.

   e. Plot a triangle at $(6, 3\frac{1}{2})$.

4. Mr. Palmer plans to bury a time capsule 10 yards behind the school. What else should he do to make naming the location of the time capsule more accurate?



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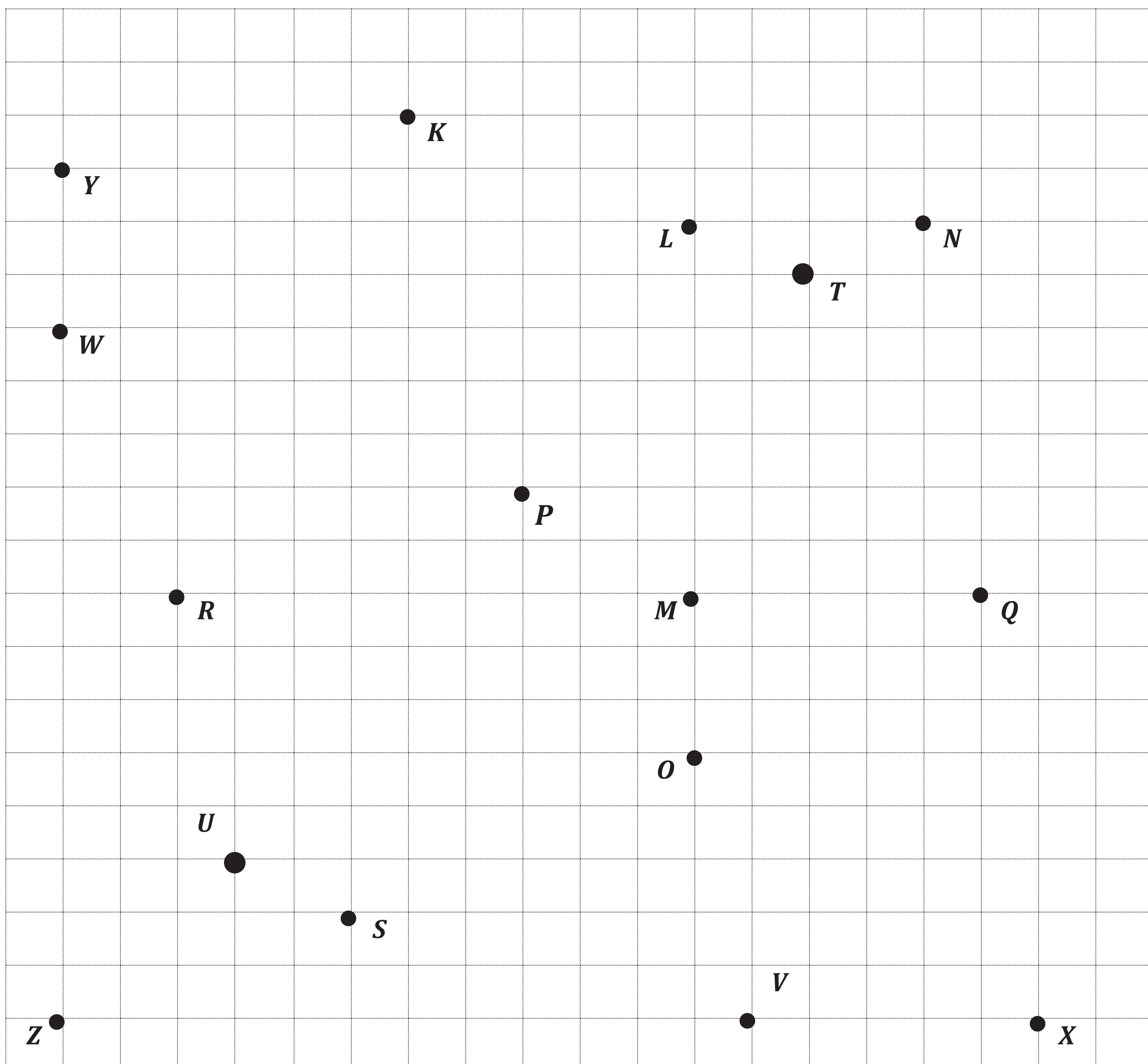
Name ______________________________ Date ________________

1. Use the grid below to complete the following tasks.
   a. Construct a y-axis that passes through points Y and Z.
   b. Construct a perpendicular x-axis that passes through points Z and X.
   c. Label the origin as 0.
   d. The y-coordinate of W is $2\frac{3}{5}$. Label the whole numbers along the y-axis.
   e. The x-coordinate of V is $2\frac{2}{5}$. Label the whole numbers along the x-axis.



2. For all of the following problems, consider the points K through X on the previous page.

   a. Identify all of the points that have a y-coordinate of $1\frac{3}{5}$.

   b. Identify all of the points that have an x-coordinate of $2\frac{1}{5}$.

   c. Which point is $1\frac{3}{5}$ units above the x-axis *and* $3\frac{1}{5}$ units to the right of the y-axis? Name the point and give its coordinate pair.

   d. Which point is located $1\frac{1}{5}$ units from the y-axis?

   e. Which point is located $\frac{2}{5}$ units along the x-axis?

   f. Give the coordinate pair for each of the following points.

      T: ________ U: ________ S: ________ K: ________

   g. Name the points located at the following coordinates.

      $(\frac{3}{5}, \frac{3}{5})$ ______ $(3\frac{2}{5}, 0)$ ______ $(2\frac{1}{5}, 3)$ ______ $(0, 2\frac{3}{5})$ ______

   h. Plot a point whose x- and y-coordinates are equal. Label your point E.

   i. What is the name for the point on the plane where the two axes intersect? ___________ Give the coordinates for this point. (____ , ____)

   j. Plot the following points.

      A: $(1\frac{1}{5}, 1)$ B: $(\frac{1}{5}, 3)$ C: $(2\frac{4}{5}, 2\frac{2}{5})$ D: $(1\frac{1}{5}, 0)$

   k. What is the distance between L and N, or LN?

   l. What is the distance of MQ?

   m. Would RM be greater than, less than, or equal to $LN + MQ$?

   n. Leslie was explaining how to plot points on the coordinate plane to a new student, but she left off some important information. Correct her explanation so that it is complete.

      "All you have to do is read the coordinates; for example, if it says (4, 7), count four, then seven, and put a point where the two grid lines intersect."

Name ____ Date ______________________

Your homework is to play at least one game of *Battleship* with a friend or family member. You can use the directions from class to teach your opponent. You and your opponent should record your guesses, hits, and misses on the sheet as you did in class.

When you have finished your game, answer these questions.

1. When you guess a point that is a hit, how do you decide which points to guess next?

2. How could you change the coordinate plane to make the game easier or more challenging?

3. Which strategies worked best for you when playing this game?

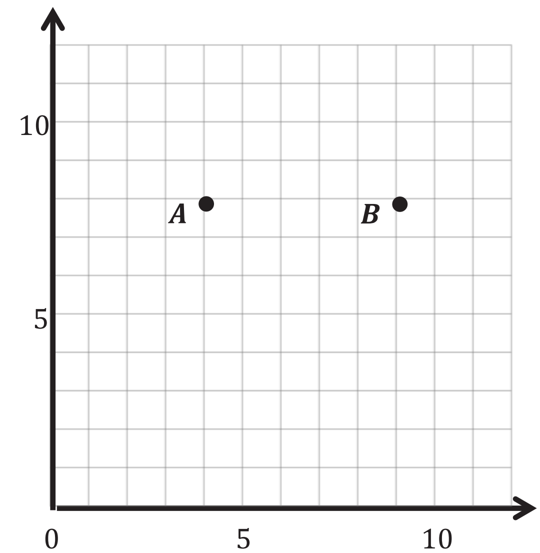
Name ______________________________ Date ________________

1. Use the coordinate plane to answer the questions.
   a. Use a straightedge to construct a line that goes through points A and B. Label the line g.
   b. Line g is parallel to the ______-axis and is perpendicular to the ______-axis.
   c. Draw two more points on line g. Name them C and D.
   d. Give the coordinates of each point below.

      A: ________ B: ________

      C: ________ D: ________

   e. What do all of the points on line g have in common?



   f. Give the coordinates of another point that falls on line g with an x-coordinate greater than 25.

2. Plot the following points on the coordinate plane to the right.

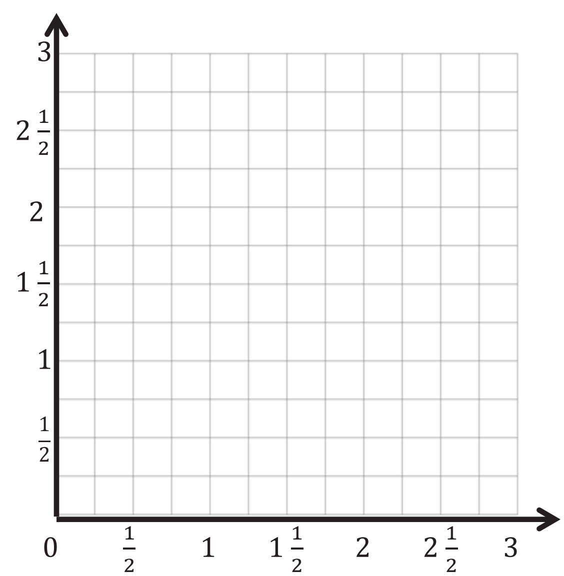
   H: $(\frac{3}{4}, 3)$ I: $(\frac{3}{4}, 2\frac{1}{4})$

   J: $(\frac{3}{4}, \frac{1}{2})$ K: $(\frac{3}{4}, 1\frac{3}{4})$

   a. Use a straightedge to draw a line to connect these points. Label the line f.
   b. In line f, x = ______ for all values of y.
   c. Circle the correct word:

      Line f is *parallel* *perpendicular* to the x-axis.

      Line f is *parallel* *perpendicular* to the y-axis.



   d. What pattern occurs in the coordinate pairs that make line f vertical?

3. For each pair of points below, think about the line that joins them. For which pairs is the line parallel to the x-axis? Circle your answer(s). Without plotting them, explain how you know.

   a. (3.2, 7) and (5, 7) b. (8, 8.4) and (8, 8.8) c. $(6\frac{1}{2}, 12)$ and (6.2, 11)

4. For each pair of points below, think about the line that joins them. For which pairs is the line parallel to the y-axis? Circle your answer(s). Then, give 2 other coordinate pairs that would also fall on this line.

   a. (3.2, 8.5) and (3.22, 24) b. $(13\frac{1}{3}, 4\frac{2}{3})$ and $(13\frac{1}{3}, 7)$ c. (2.9, 5.4) and (7.2, 5.4)

5. Write the coordinate pairs of 3 points that can be connected to construct a line that is $5\frac{1}{2}$ units to the right of and parallel to the y-axis.

   a. ________________ b. ________________ c. ________________

6. Write the coordinate pairs of 3 points that lie on the y-axis.

   a. ________________ b. ________________ c. ________________

7. Leslie and Peggy are playing *Battleship* on axes labeled in halves. Presented in the table is a record of Peggy's guesses so far. What should she guess next? How do you know? Explain using words and pictures.

$(5, 5)$	miss
$(4, 5)$	hit
$(3\frac{1}{2}, 5)$	miss
$(4\frac{1}{2}, 5)$	miss

Name ____ Date ______________________

1. Plot and label the following points on the coordinate plane.

   C: (0.4, 0.4) A: (1.1, 0.4) S: (0.9, 0.5) T: (0.9, 1.1)

   a. Use a straightedge to construct line segments $\overline{CA}$ and $\overline{ST}$.

   b. Name the line segment that is perpendicular to the x-axis and parallel to the y-axis. _________

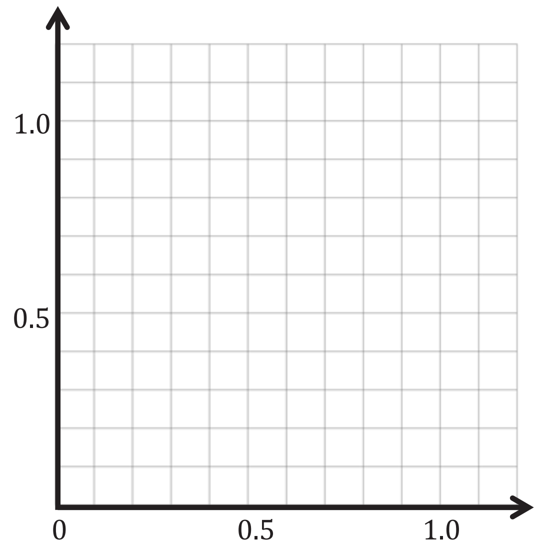
   c. Name the line segment that is parallel to the x-axis and perpendicular to the y-axis.

   ____

   d. Plot a point on $\overline{CA}$ and name it E. Plot a point on line segment $\overline{ST}$ and name it R.

   e. Write the coordinates of points E and R.

   E (____ , ____) R (____ , ____)



2. Construct line $\boldsymbol{m}$ such that the y-coordinate of every point is $1\frac{1}{2}$, and construct line $\boldsymbol{n}$ such that the x-coordinate of every point is $5\frac{1}{2}$.

   a. Line $\boldsymbol{m}$ is ________ units from the x-axis.

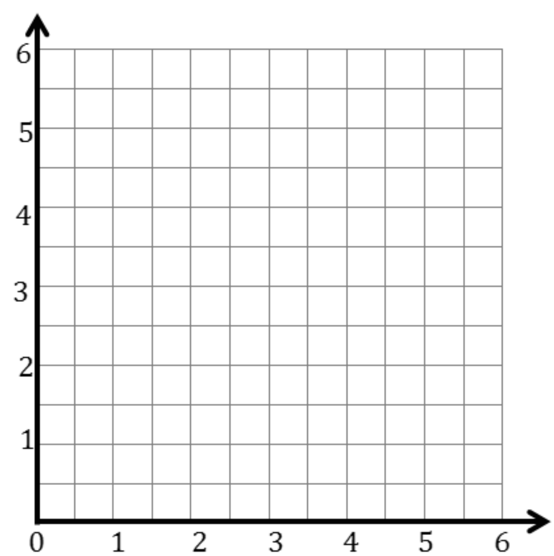
   b. Give the coordinates of the point on line $\boldsymbol{m}$ that is 2 units from the y-axis. ________

   c. With a blue pencil, shade the portion of the grid that is less than $1\frac{1}{2}$ units from the x-axis.

   d. Line $\boldsymbol{n}$ is _________ units from the y-axis.

   e. Give the coordinates of the point on line $\boldsymbol{n}$ that is $3\frac{1}{2}$ units from the x-axis.

   f. With a red pencil, shade the portion of the grid that is less than $5\frac{1}{2}$ units from the y-axis.



3. Construct and label lines $\boldsymbol{e}, \boldsymbol{r}, \boldsymbol{s}, \boldsymbol{o}$ on the plane below.

   a. Line $\boldsymbol{e}$ is 3.75 units above the x-axis.

   b. Line $\boldsymbol{r}$ is 2.5 units from the y-axis.

   c. Line $\boldsymbol{s}$ is parallel to line $\boldsymbol{e}$ but 0.75 farther from the x-axis.

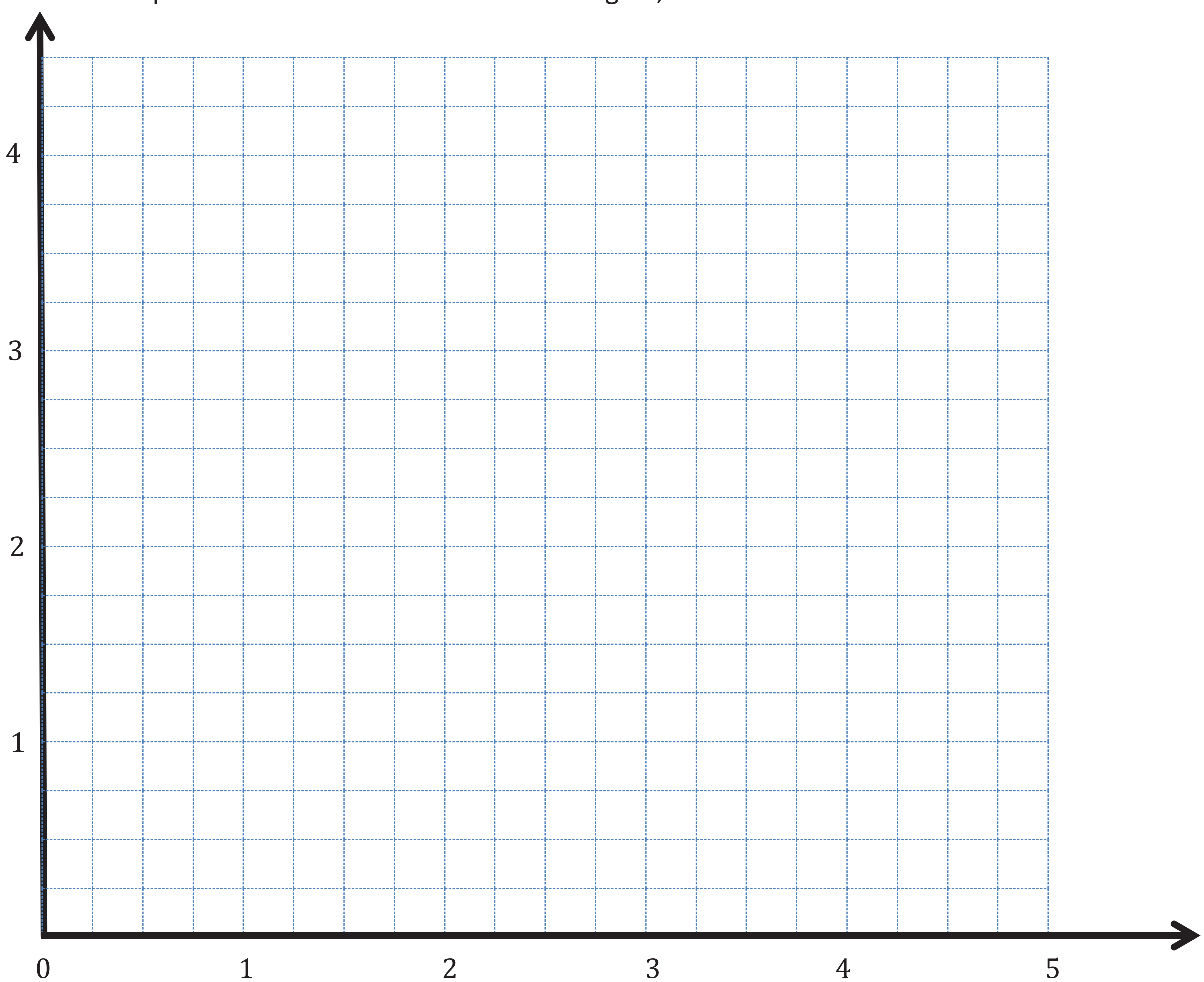
   d. Line $\boldsymbol{o}$ is perpendicular to lines $\boldsymbol{s}$ and $\boldsymbol{e}$ and passes through the point $(3\frac{1}{4}, 3\frac{1}{4})$.

4. Complete the following tasks on the plane.

   a. Using a blue pencil, shade the region that contains points that are more than $2\frac{1}{2}$ units and less than $3\frac{1}{4}$ units from the y-axis.

   b. Using a red pencil, shade the region that contains points that are more than $3\frac{3}{4}$ units and less than $4\frac{1}{2}$ units from the x-axis.

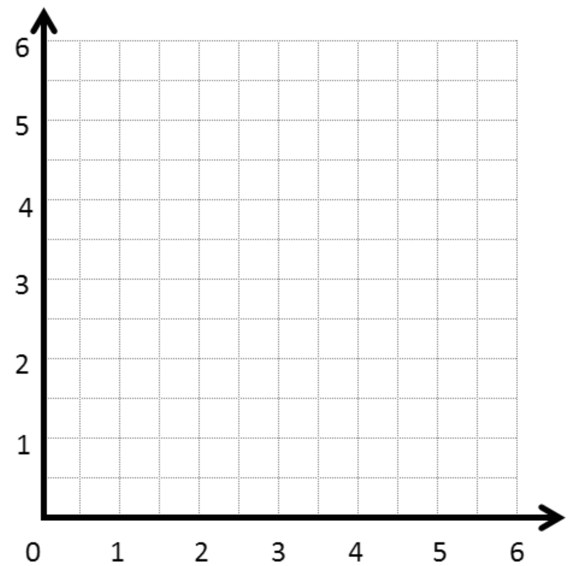
   c. Plot a point that lies in the double shaded region, and label its coordinates.



Name ____ Date ______________________

1. Complete the chart. Then, plot the points on the coordinate plane.

x	y	(x, y)
2	0	
$3\frac{1}{2}$	$1\frac{1}{2}$	
$4\frac{1}{2}$	$2\frac{1}{2}$	
6	4	



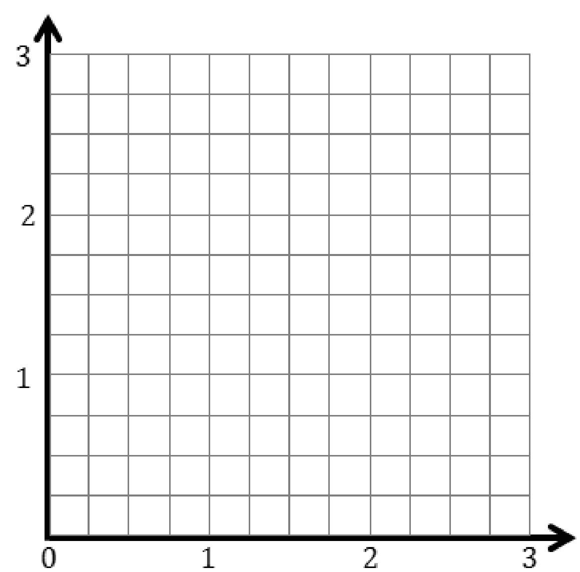
a. Use a straightedge to draw a line connecting these points.

b. Write a rule showing the relationship between the x- and y-coordinates of points on this line.

c. Name two other points that are also on this line. ____________ ____________

2. Complete the chart. Then, plot the points on the coordinate plane.

x	y	(x, y)
0	0	
$\frac{1}{4}$	$\frac{3}{4}$	
$\frac{1}{2}$	$1\frac{1}{2}$	
1	3	



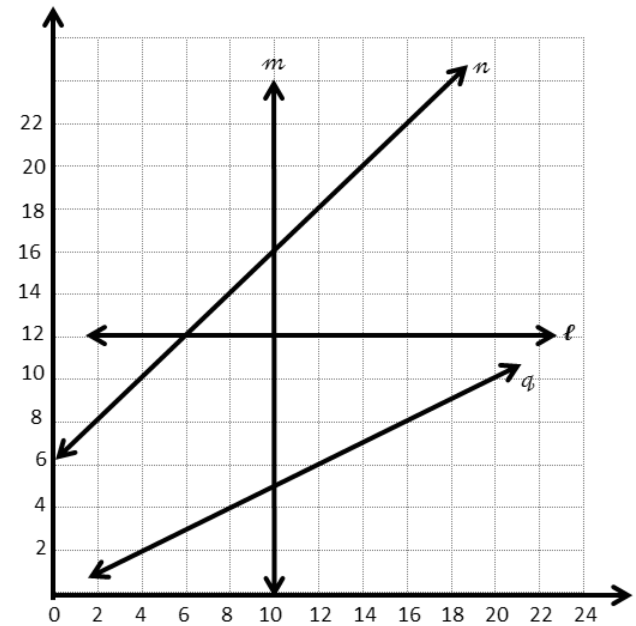
a. Use a straightedge to draw a line connecting these points.

b. Write a rule showing the relationship between the x- and y- coordinates for points on the line.

c. Name two other points that are also on this line. ____________ ____________

3. Use the coordinate plane to answer the following questions.

   a. For any point on line $\boldsymbol{m}$, the x-coordinate is _______.



   b. Give the coordinates for 3 points that are on line $\boldsymbol{n}$.

   c. Write a rule that describes the relationship between the x- and y-coordinates on line $\boldsymbol{n}$.

   d. Give the coordinates for 3 points that are on line $\boldsymbol{q}$.

   e. Write a rule that describes the relationship between the x- and y-coordinates on line $\boldsymbol{q}$.

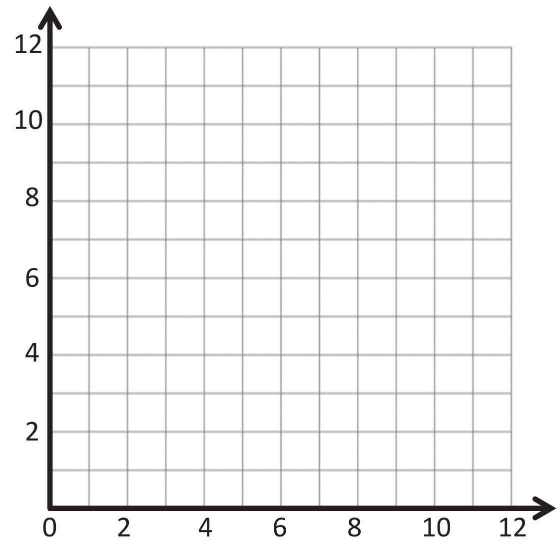
   f. Identify a line on which each of these points lie.

   i. (10, 3.2) ______   ii. (12.4, 18.4) ______   iii. (6.45, 12) ______   iv. (14, 7) ______

Name ____ Date ______________________

1. Complete this table such that each y-coordinate is 4 more than the corresponding x-coordinate.

x	y	(x, y)



a. Plot each point on the coordinate plane.

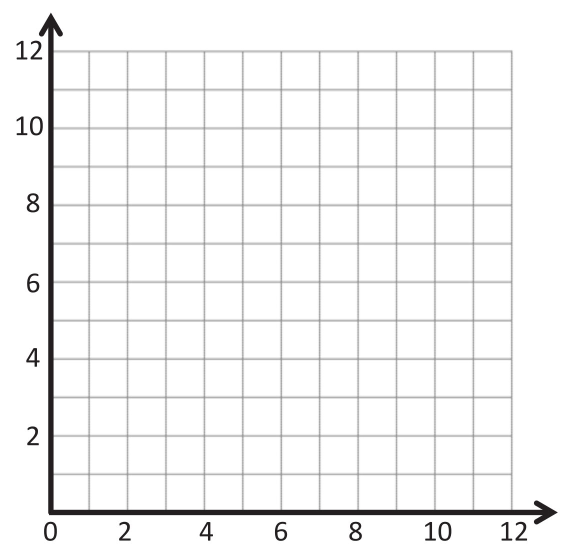
b. Use a straightedge to construct a line connecting these points.

c. Give the coordinates of 2 other points that fall on this line with x-coordinates greater than 18.

(______ , ______) and (______ , ______)

2. Complete this table such that each y-coordinate is 2 times as much as its corresponding x-coordinate.

x	y	(x, y)



a. Plot each point on the coordinate plane.

b. Use a straightedge to draw a line connecting these points.

c. Give the coordinates of 2 other points that fall on this line with y-coordinates greater than 25.

(______ , ______) and (______ , ______)

3. Use the coordinate plane below to complete the following tasks.

   a. Graph these lines on the plane.

line ℓ: x is equal to y

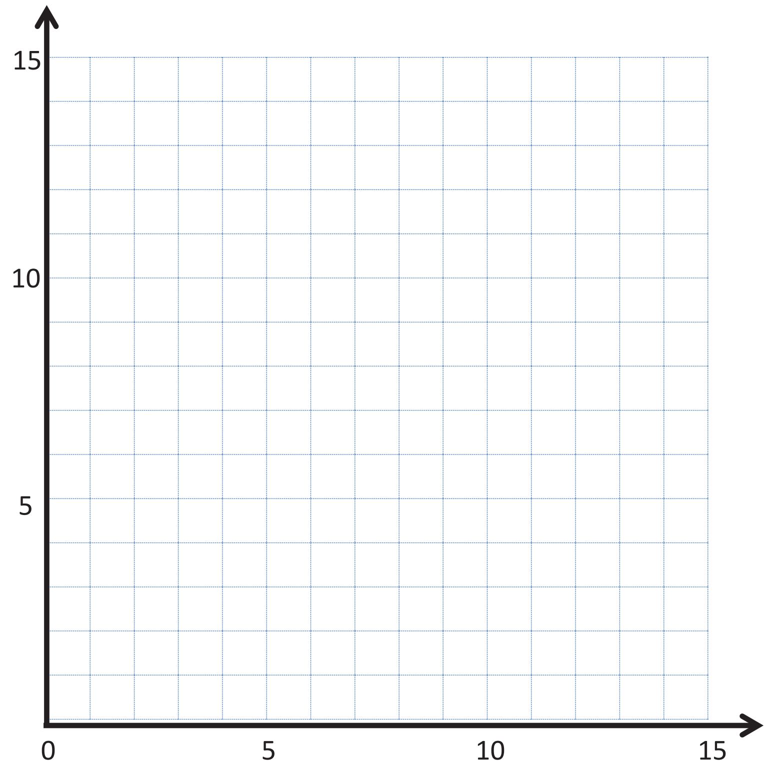
	x	y	(x, y)
A			
B			
C			

line m: y is 1 less than x

	x	y	(x, y)
G			
H			
I			

line n: y is 1 less than twice x

	x	y	(x, y)
S			
T			
U			



   b. Do any of these lines intersect? If yes, identify which ones, and give the coordinates of their intersection.

   c. Are any of these lines parallel? If yes, identify which ones.

   d. Give the rule for another line that would be parallel to the lines you listed in (c).

Name ____ Date ____________________

1. Complete the table for the given rules.

Line $\boldsymbol{a}$

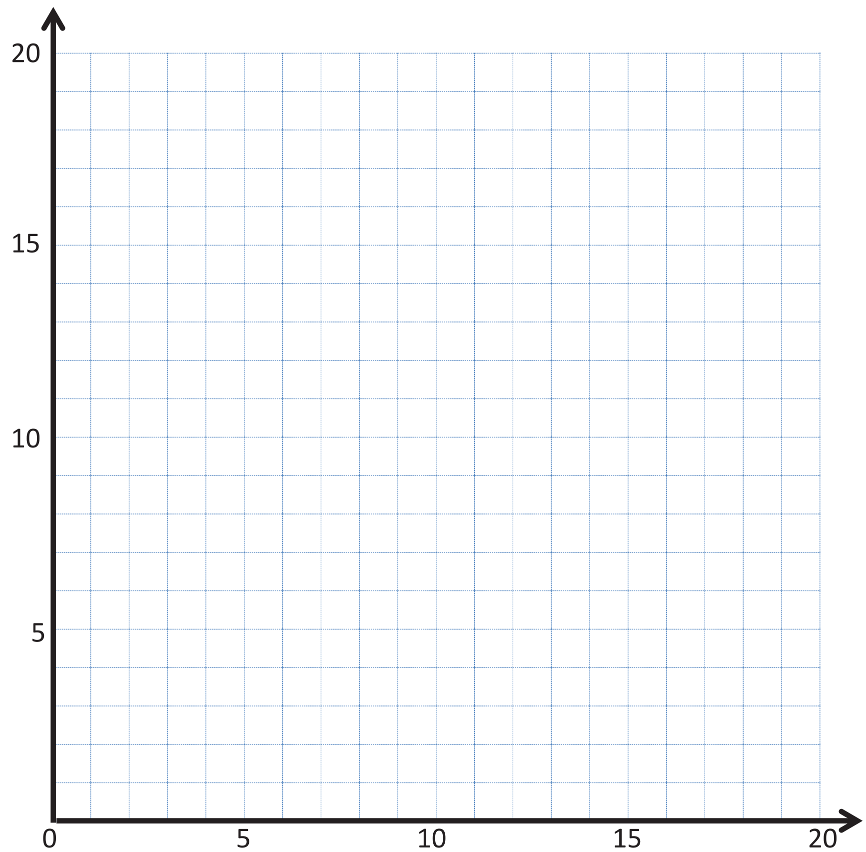
Rule: y is 1 less than x

x	y	(x, y)
1		
4		
9		
16		

Line $\boldsymbol{b}$

Rule: y is 5 less than x

x	y	(x, y)
5		
8		
14		
20		



a. Construct each line on the coordinate plane.

b. Compare and contrast these lines.

c. Based on the patterns you see, predict what line $\boldsymbol{c}$, whose rule is *y is 7 less than x*, would look like. Draw your prediction on the plane above.

2. Complete the table for the given rules.

Line $\boldsymbol{e}$

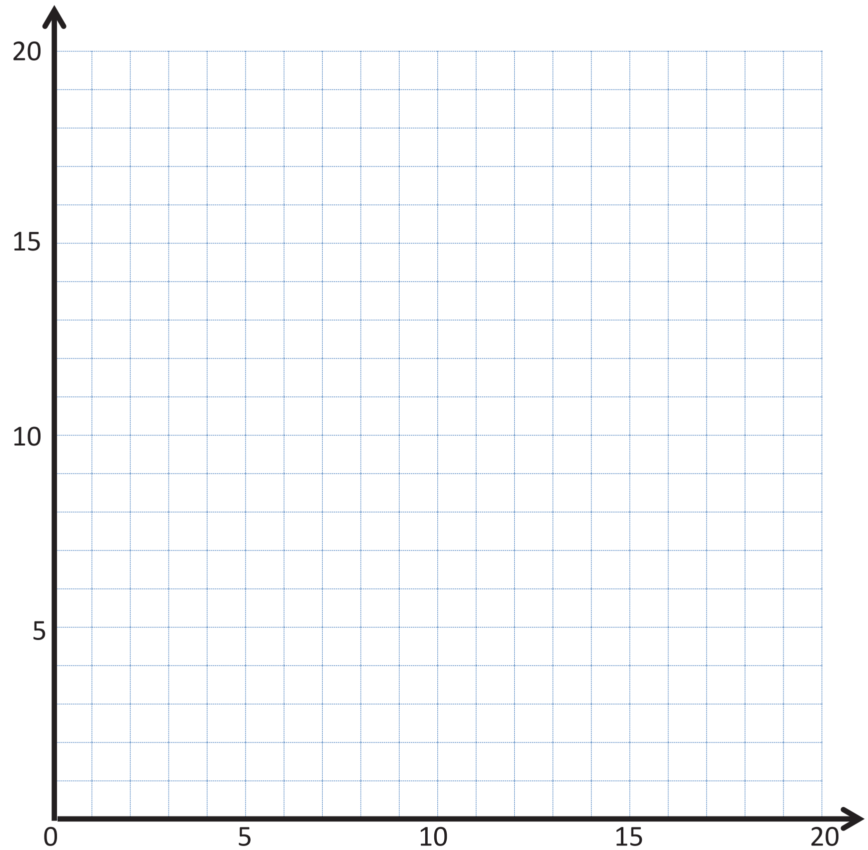
Rule: y is 3 times as much as x

x	y	(x, y)
0		
1		
4		
6		

Line $\boldsymbol{f}$

Rule: y is a third as much as x

x	y	(x, y)
0		
3		
9		
15		



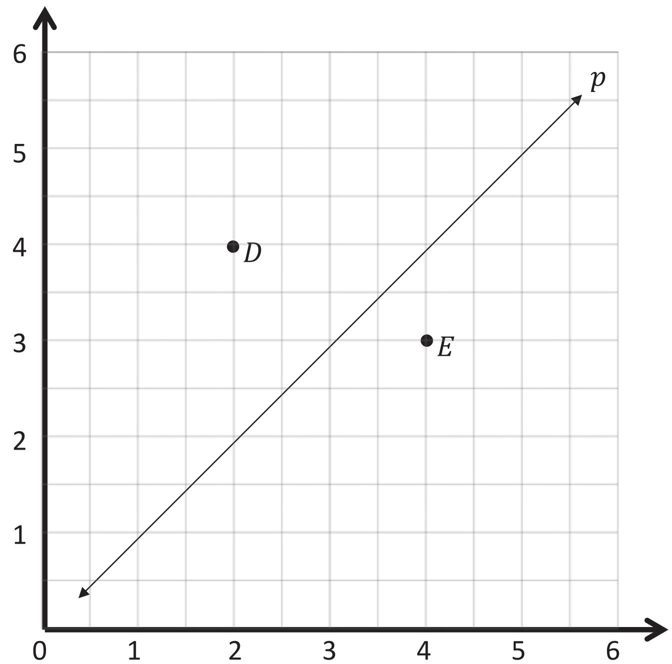
a. Construct each line on the coordinate plane.

b. Compare and contrast these lines.

c. Based on the patterns you see, predict what line $\boldsymbol{g}$, whose rule is *y is 4 times as much as x*, and line $\boldsymbol{h}$, whose rule is *y is one-fourth as much as x*, would look like. Draw your prediction in the plane above.

Name ____ Date ____________________

1. Use the coordinate plane to complete the following tasks.



   a. Line $\boldsymbol{p}$ represents the rule x *and* y *are equal*.

   b. Construct a line, $\boldsymbol{d}$, that is parallel to line $\boldsymbol{p}$ and contains point D.

   c. Name 3 coordinate pairs on line $\boldsymbol{d}$.

   d. Identify a rule to describe line $\boldsymbol{d}$.

   e. Construct a line, $\boldsymbol{e}$, that is parallel to line $\boldsymbol{p}$ and contains point E.

   f. Name 3 points on line $\boldsymbol{e}$.

   g. Identify a rule to describe line $\boldsymbol{e}$.

   h. Compare and contrast lines $\boldsymbol{d}$ and $\boldsymbol{e}$ in terms of their relationship to line $\boldsymbol{p}$.

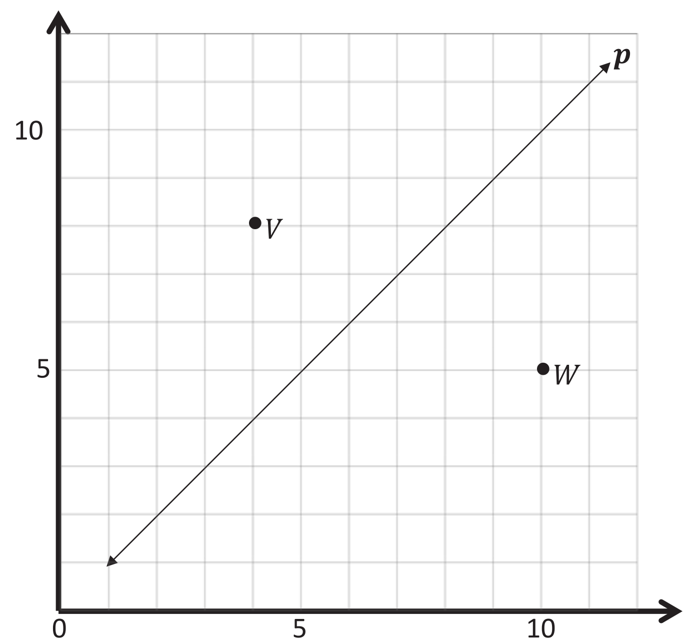
2. Write a rule for a fourth line that would be parallel to those above and that would contain the point $(5\frac{1}{2}, 2)$. Explain how you know.

3. Use the coordinate plane below to complete the following tasks.

   a. Line $\boldsymbol{p}$ represents the rule x *and* y *are equal*.

   b. Construct a line, $\boldsymbol{v}$, that contains the origin and point V.

   c. Name 3 points on line $\boldsymbol{v}$.



   d. Identify a rule to describe line $\boldsymbol{v}$.

   e. Construct a line, $\boldsymbol{w}$, that contains the origin and point W.

   f. Name 3 points on line $\boldsymbol{w}$.

   g. Identify a rule to describe line $\boldsymbol{w}$.

   h. Compare and contrast lines $\boldsymbol{v}$ and $\boldsymbol{w}$ in terms of their relationship to line $\boldsymbol{p}$.

   i. What patterns do you see in lines that are generated by multiplication rules?

Name ______________________________ Date ______________

1. Complete the tables for the given rules.

Line $\boldsymbol{\ell}$

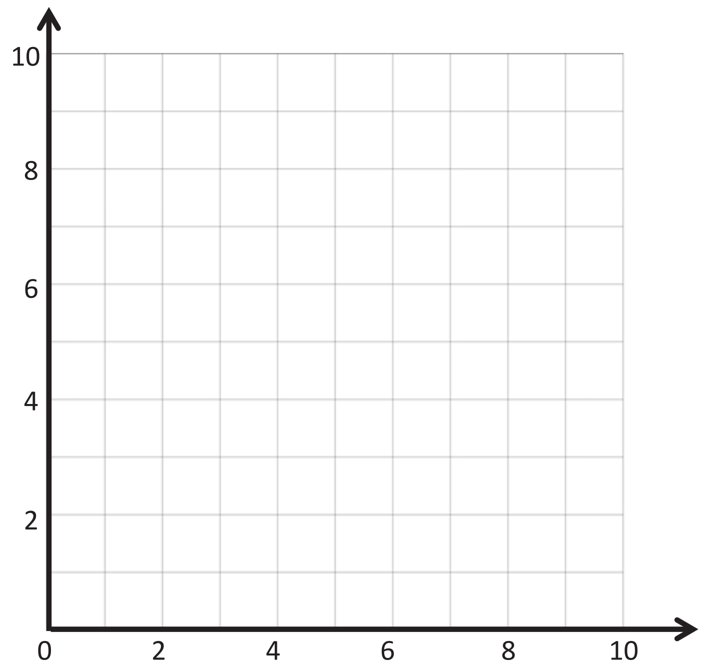
Rule: *Double* x

x	y	(x, y)
1		
2		
3		

Line $\boldsymbol{m}$

Rule: *Double* x*, then subtract 1*

x	y	(x, y)
1		
2		
3		



a. Draw each line on the coordinate plane above.

b. Compare and contrast these lines.

c. Based on the patterns you see, predict what the line for the rule *double* x*, then add 1* would look like. Draw your prediction on the plane above.

2. Circle the point(s) that the line for the rule *multiply* x *by* $\frac{1}{2}$*, then add 1* would contain.

$(0, \frac{1}{2})$ $(2, 1\frac{1}{4})$ $(2, 2)$ $(3, \frac{1}{2})$

a. Explain how you know.

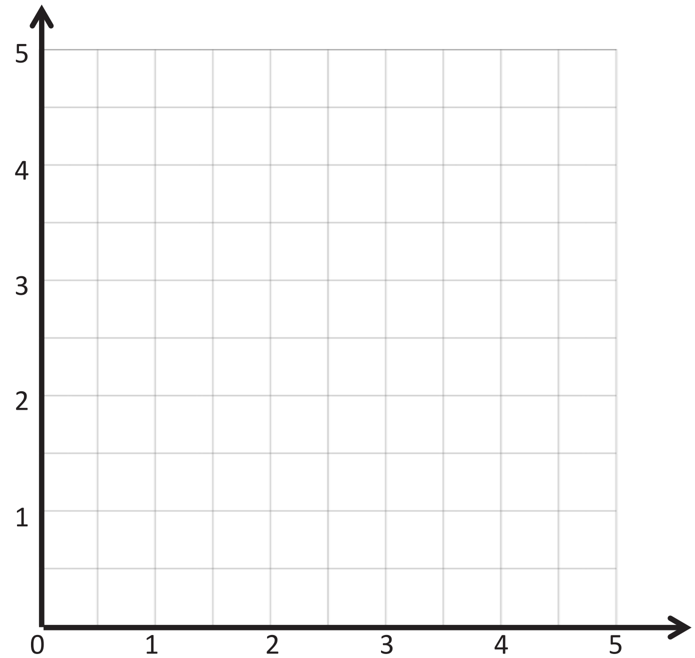
b. Give two other points that fall on this line.

3. Complete the tables for the given rules.

Line $\boldsymbol{\ell}$

Rule: *Halve x, then add 1*

x	y	(x, y)
0		
1		
2		
3		



Line $\boldsymbol{m}$

Rule: *Halve x, then add $1\frac{1}{4}$*

x	y	(x, y)
0		
1		
2		
3		

a. Draw each line on the coordinate plane above.

b. Compare and contrast these lines.

c. Based on the patterns you see, predict what the line for the rule *halve x, then subtract 1* would look like. Draw your prediction on the plane above.

4. Circle the point(s) that the line for the rule *multiply x by $\frac{3}{4}$, then subtract $\frac{1}{2}$* would contain.

$(1, \frac{1}{4})$ $(2, \frac{1}{4})$ $(3, 1\frac{3}{4})$ $(3, 1)$

a. Explain how you know.

b. Give two other points that fall on this line.

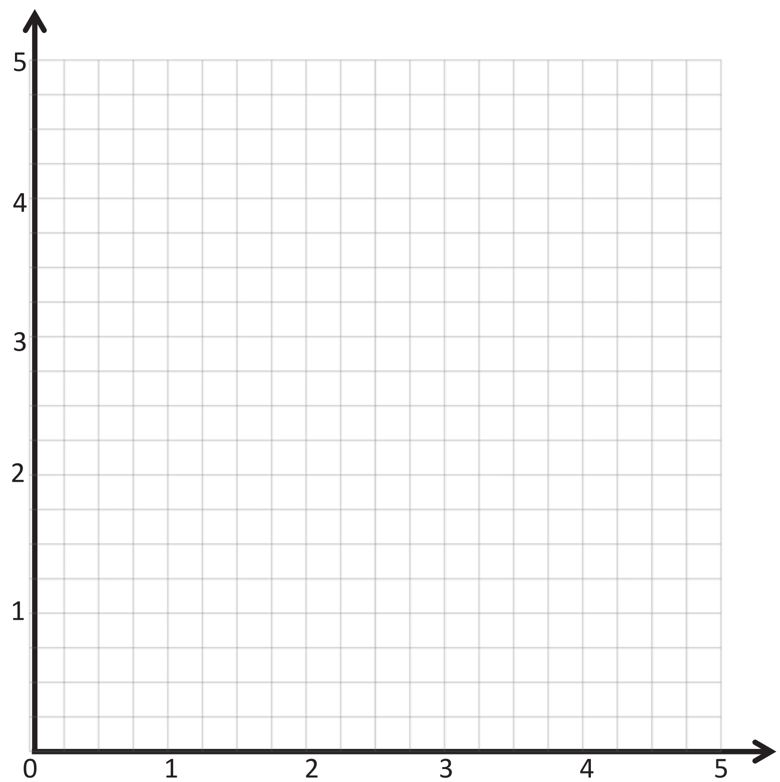
Name ____ Date ______________________

1. Write a rule for the line that contains the points $(0, \frac{1}{4})$ and $(2\frac{1}{2}, 2\frac{3}{4})$.

   a. Identify 2 more points on this line. Draw the line on the grid below.

Point	x	y	(x, y)
B			
C			

   b. Write a rule for a line that is parallel to $\overleftrightarrow{BC}$ and goes through point $(1, 2\frac{1}{4})$.



2. Give the rule for the line that contains the points $(1, 2\frac{1}{2})$ and $(2\frac{1}{2}, 2\frac{1}{2})$.

   a. Identify 2 more points on this line. Draw the line on the grid above.

Point	x	y	(x, y)
G			
H			

   b. Write a rule for a line that is parallel to $\overleftrightarrow{GH}$.

3. Give the rule for a line that contains the point $(\frac{3}{4}, 1\frac{1}{2})$, using the operation or description below. Then, name 2 other points that would fall on each line.

a. Addition: ________________

Point	x	y	(x, y)
T			
U			

b. A line parallel to the x-axis: ________________

Point	x	y	(x, y)
G			
H			

c. Multiplication: ________________

Point	x	y	(x, y)
A			
B			

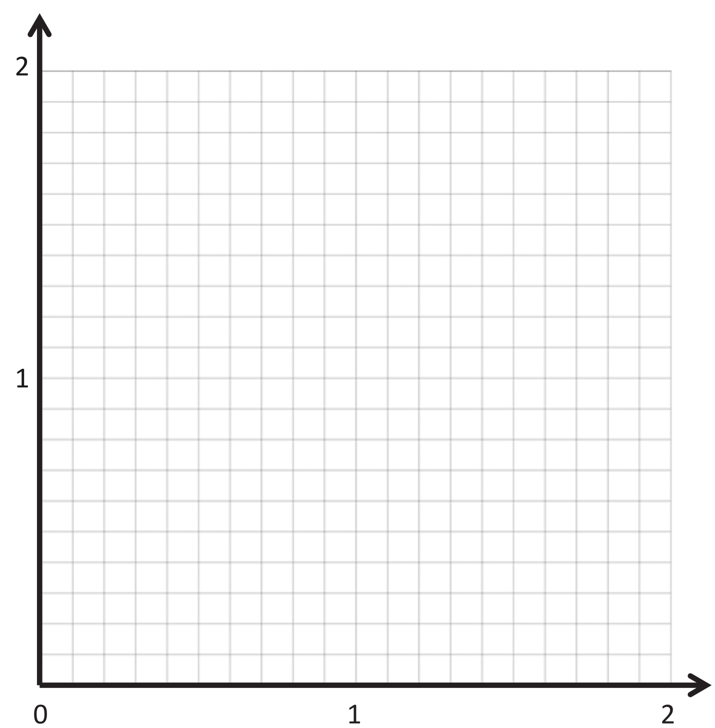
d. A line parallel to the y-axis: ________________

Point	x	y	(x, y)
V			
W			

e. Multiplication with addition: _______________

Point	x	y	(x, y)
R			
S			

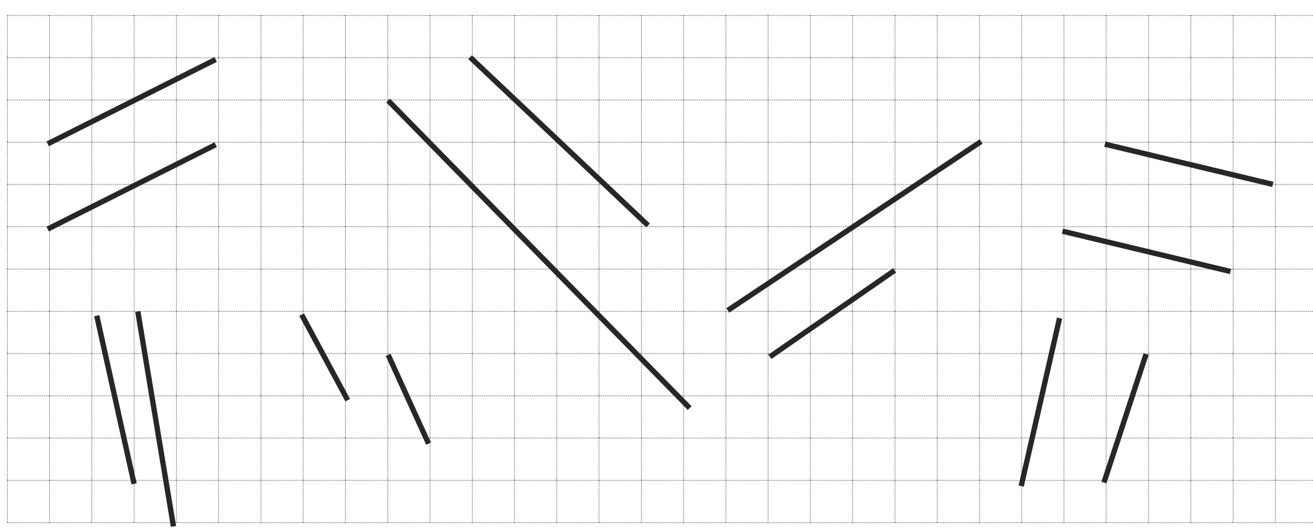
4. On the grid, two lines intersect at (1.2, 1.2). If line a passes through the origin, and line b contains the point (1.2, 0), write a rule for line a and line b.



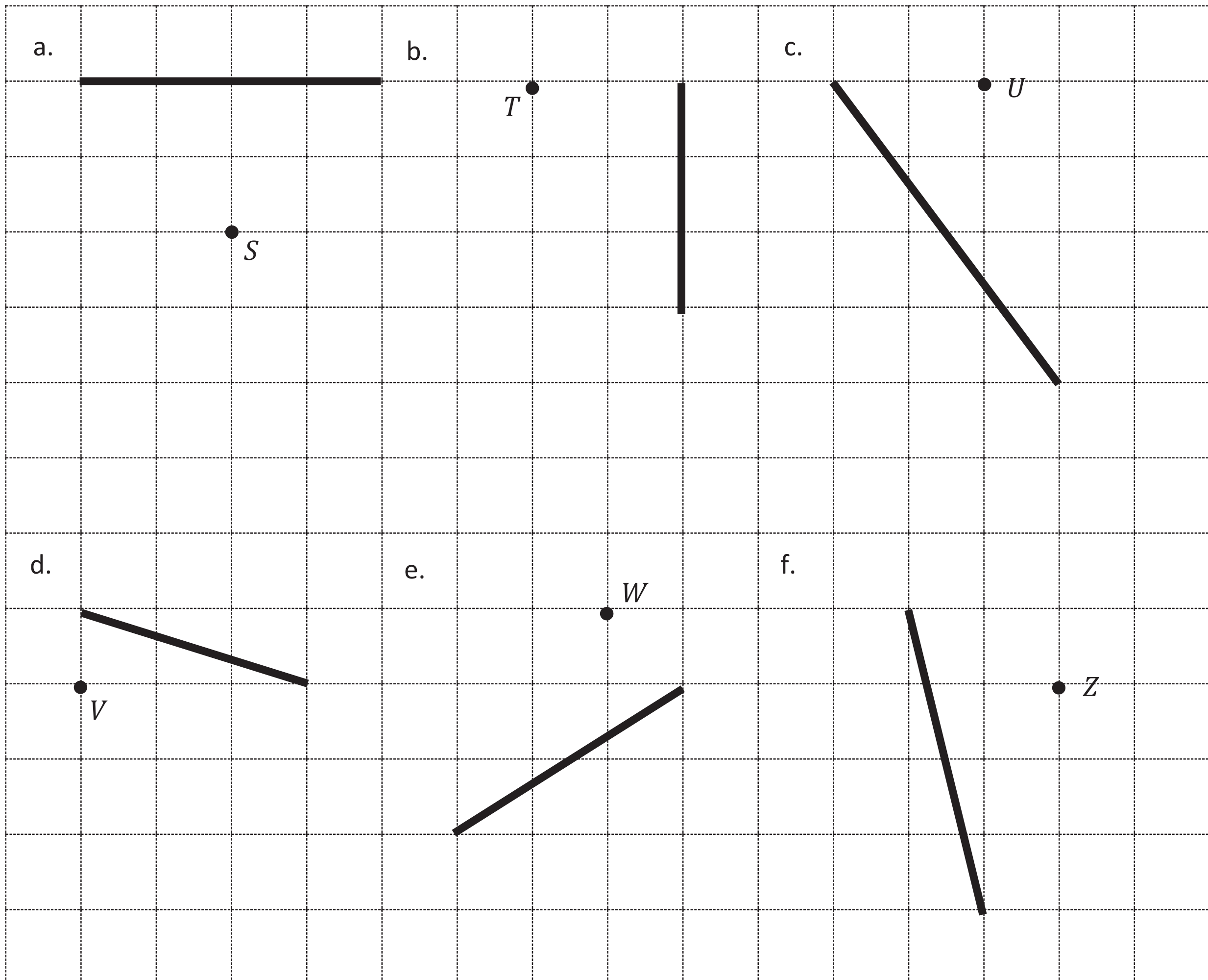
Name ____ Date ______________________

1. Use your right angle template and straightedge to draw at least three sets of parallel lines in the space below.

2. Circle the segments that are parallel.



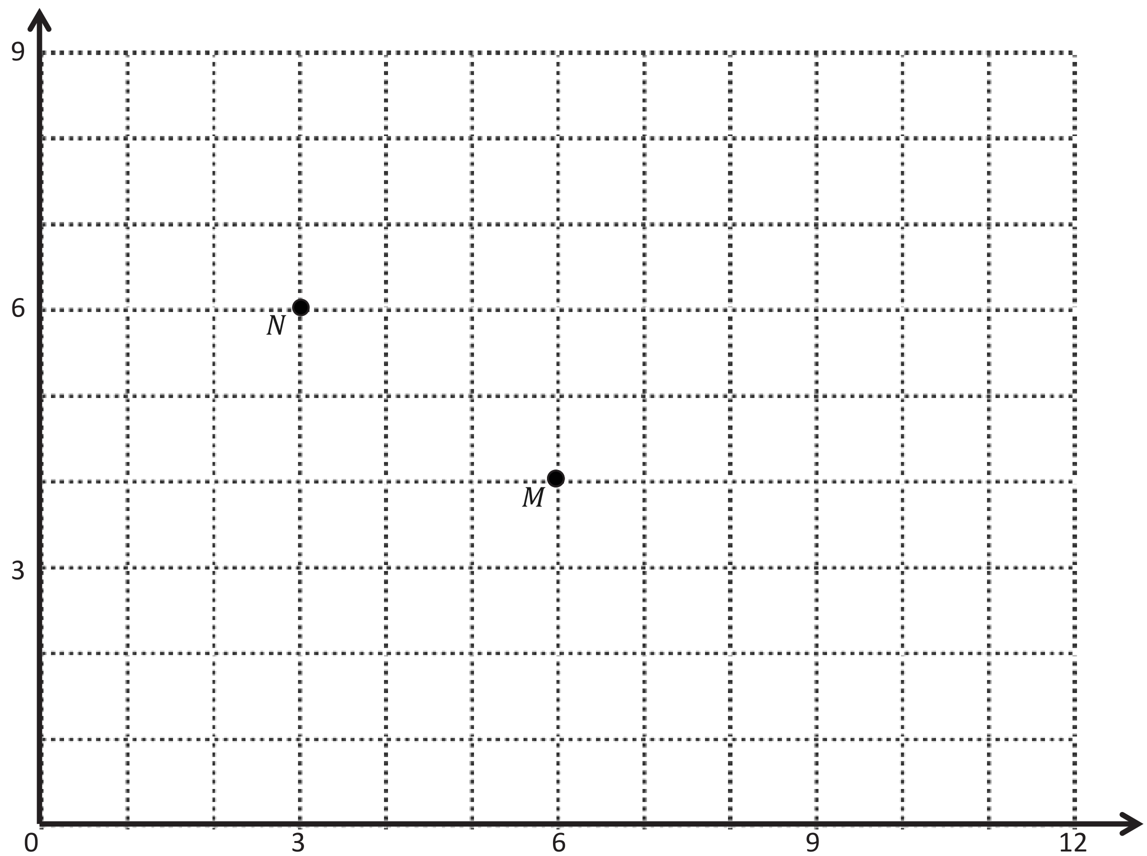
3. Use your straightedge to draw a segment parallel to each segment through the given point.



4. Draw 2 different lines parallel to line *b*.

Name ____ Date ______________________

1. Use the coordinate plane below to complete the following tasks.



a. Identify the locations of M and N. M: (_____, _____) N: (_____, _____)

b. Draw $\overleftrightarrow{MN}$.

c. Plot the following coordinate pairs on the plane.

J: (5, 7) K: (8, 5)

d. Draw $\overleftrightarrow{JK}$.

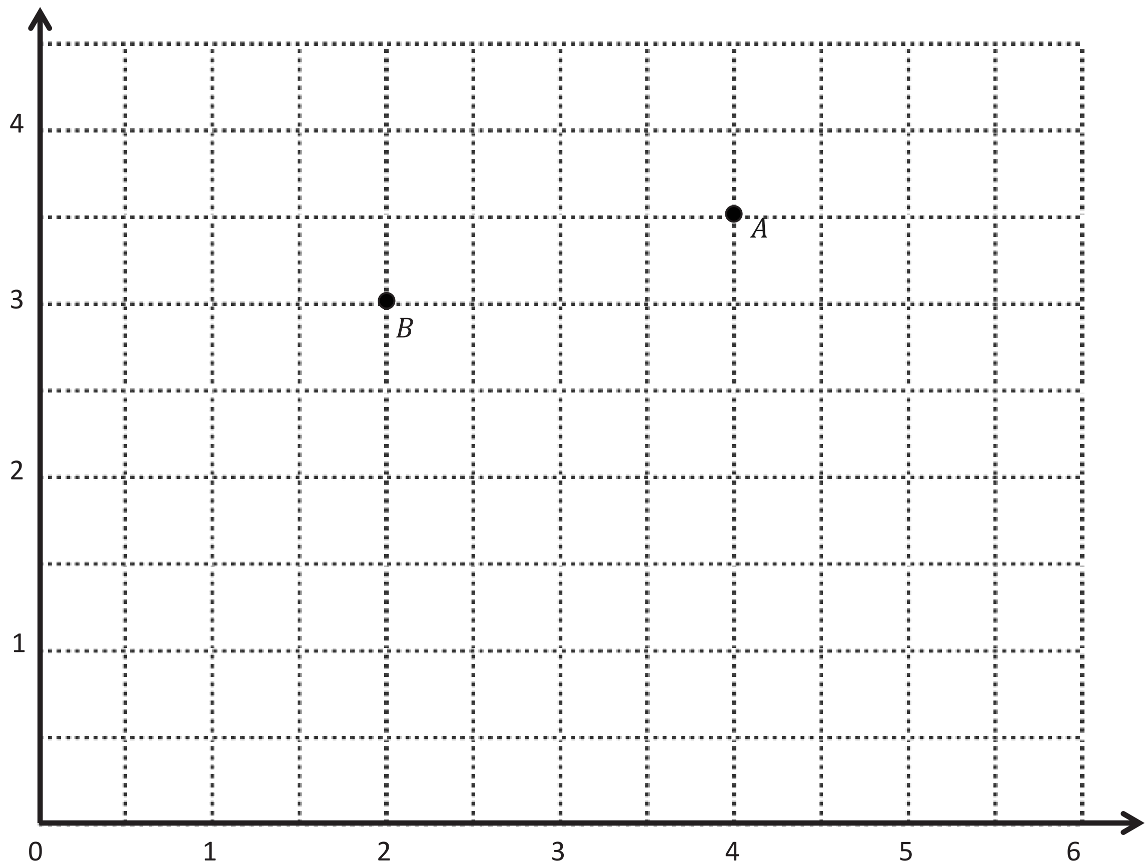
e. Circle the relationship between $\overleftrightarrow{MN}$ and $\overleftrightarrow{JK}$. $\overleftrightarrow{MN} \perp \overleftrightarrow{JK}$ $\overleftrightarrow{MN} \parallel \overleftrightarrow{JK}$

f. Give the coordinates of a pair of points, F and G, such that $\overleftrightarrow{FG} \parallel \overleftrightarrow{MN}$.

F: (_____, _____) G: (_____, _____)

g. Draw $\overleftrightarrow{FG}$.

2. Use the coordinate plane below to complete the following tasks.



a. Identify the locations of A and B. A: (_____, _____) B: (_____, _____)

b. Draw $\overleftrightarrow{AB}$.

c. Generate coordinate pairs for C and D, such that $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$.

C: (_____, _____) D: (_____, _____)

d. Draw $\overleftrightarrow{CD}$.

e. Explain the pattern you used when generating coordinate pairs for C and D.

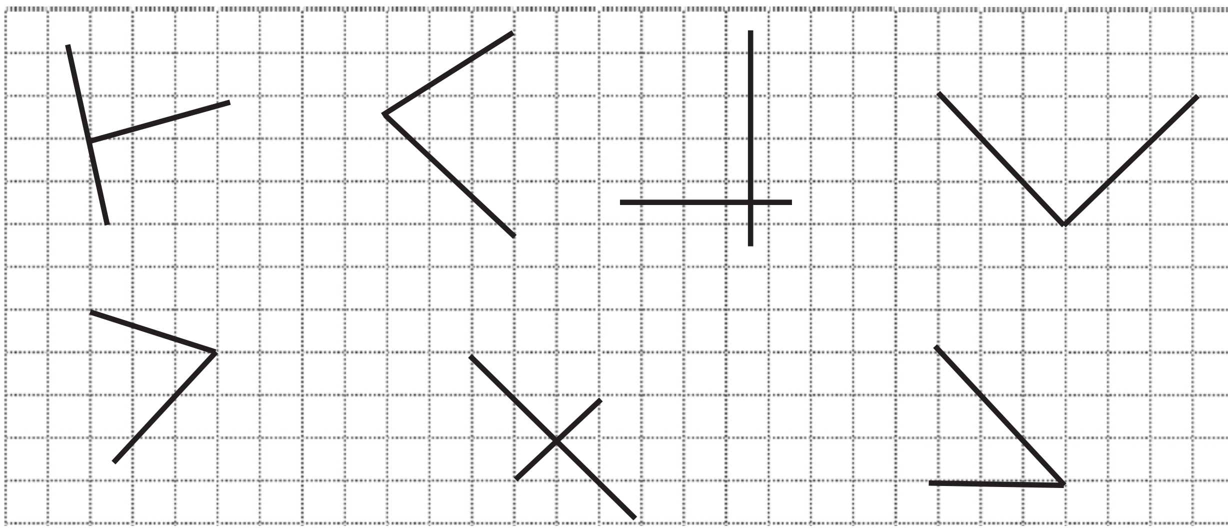
f. Give the coordinates of a point, F, such that $\overleftrightarrow{AB} \parallel \overleftrightarrow{EF}$.

E: $(2\frac{1}{2}, 2\frac{1}{2})$ F: (_____, _____)

g. Explain how you chose the coordinates for F.

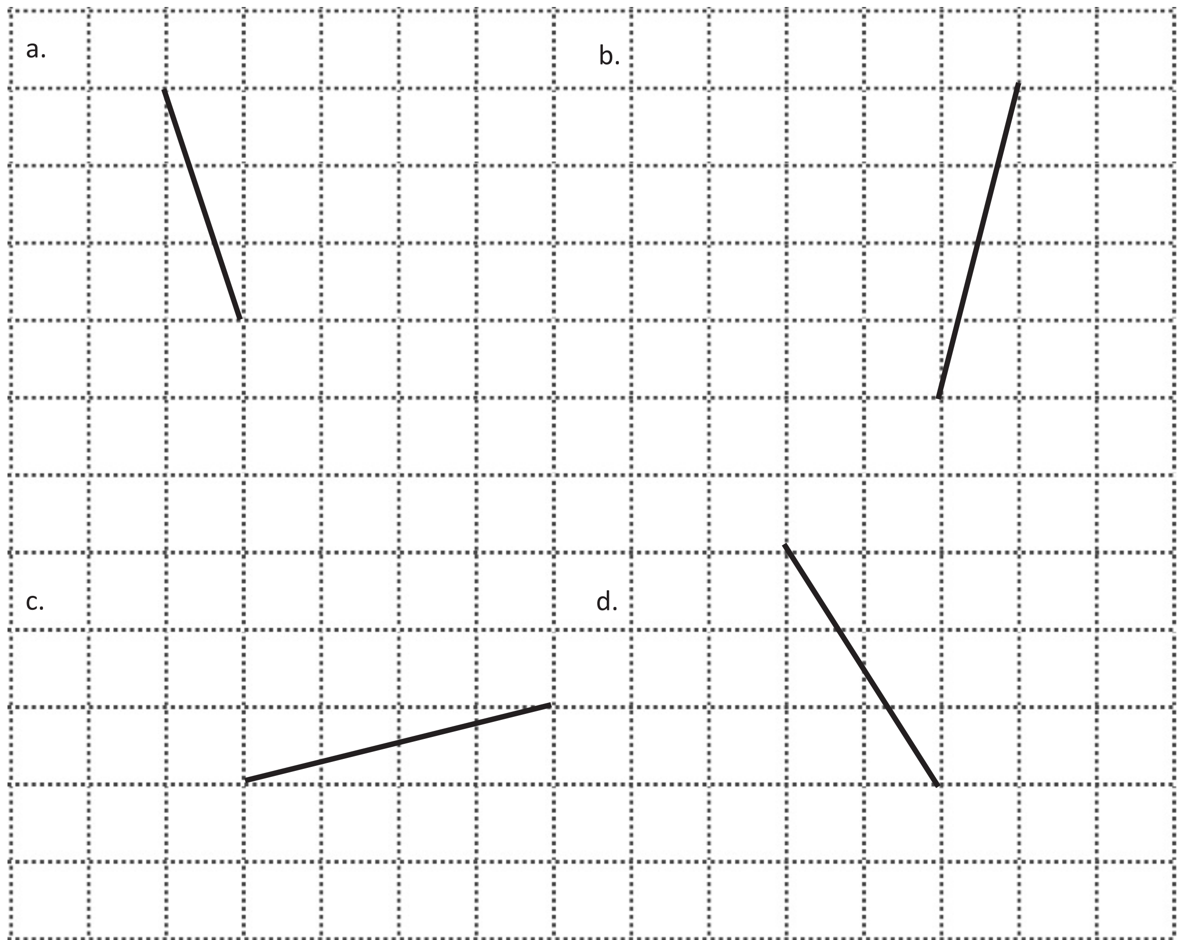
Name ____ Date ____________________

1. Circle the pairs of segments that are perpendicular.

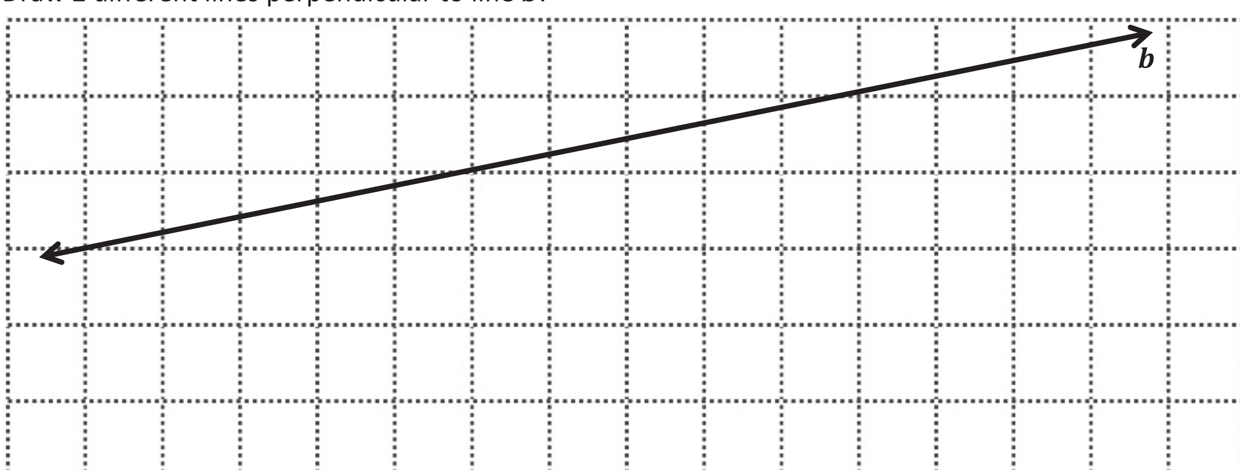


2. In the space below, use your right triangle templates to draw at least 3 different sets of perpendicular lines.

3. Draw a segment perpendicular to each given segment. Show your thinking by sketching triangles as needed.



4. Draw 2 different lines perpendicular to line b.



Name ____ Date ______________________

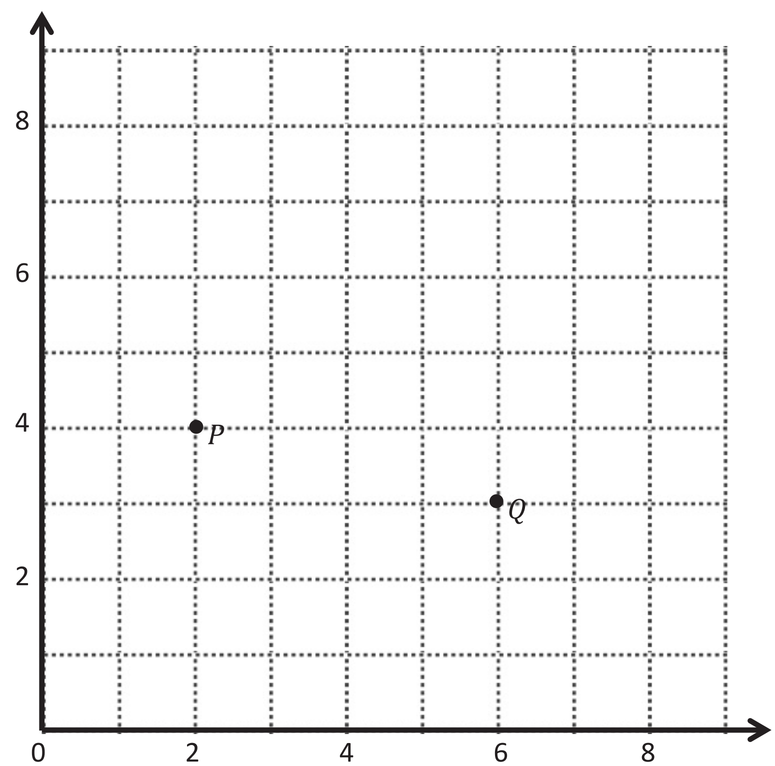
1. Use the coordinate plane below to complete the following tasks.

   a. Draw $\overline{PQ}$.

   b. Plot point R (3, 8).

   c. Draw $\overline{PR}$.

   d. Explain how you know $\angle RPQ$ is a right angle without measuring it.



   e. Compare the coordinates of points P and Q. What is the difference of the x-coordinates? The y-coordinates?

   f. Compare the coordinates of points P and R. What is the difference of the x-coordinates? The y-coordinates?

   g. What is the relationship of the differences you found in (e) and (f) to the triangles of which these two segments are a part?

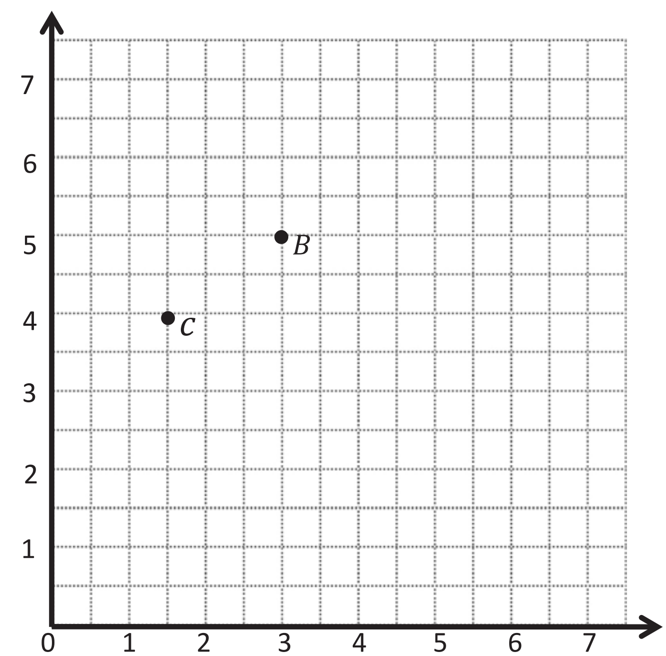
2. Use the coordinate plane below to complete the following tasks.

   a. Draw $\overline{CB}$.

   b. Plot point D $(\frac{1}{2}, 5\frac{1}{2})$.

   c. Draw $\overline{CD}$.

   d. Explain how you know $\angle DCB$ is a right angle without measuring it.



   e. Compare the coordinates of points C and B. What is the difference of the x-coordinates? The y-coordinates?

   f. Compare the coordinates of points C and D. What is the difference of the x-coordinates? The y-coordinates?

   g. What is the relationship of the differences you found in (e) and (f) to the triangles of which these two segments are a part?

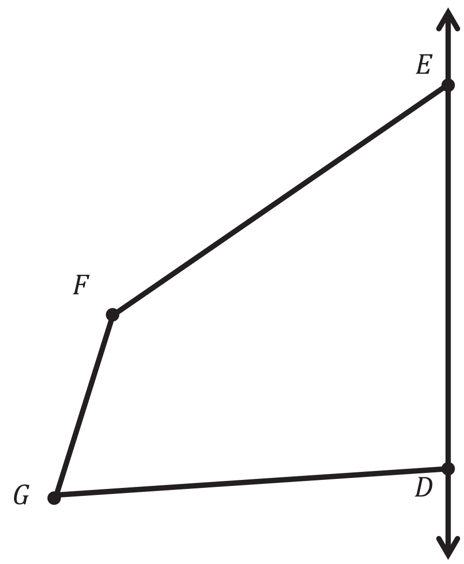
3. $\overleftrightarrow{ST}$ contains the following points. S: (2, 3) T: (9, 6)

   Give the coordinates of a pair of points, U and V, such that $\overleftrightarrow{ST} \perp \overleftrightarrow{UV}$.

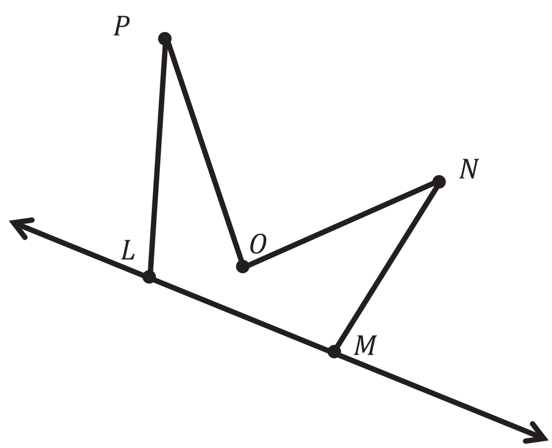
   U: (______, ______) V: (______, ______)

Name ____ Date ____________________

1. Draw to create a figure that is symmetric about $\overleftrightarrow{DE}$.



2. Draw to create a figure that is symmetric about $\overleftrightarrow{LM}$.



3. Complete the following construction in the space below.

   a. Plot 3 non-collinear points, G, H, and I.

   b. Draw $\overline{GH}$, $\overline{HI}$, and $\overleftrightarrow{IG}$.

   c. Plot point J, and draw the remaining sides, such that quadrilateral $GHIJ$ is symmetric about $\overleftrightarrow{IG}$.

4. In the space below, use your tools to draw a symmetric figure about a line.

Name ______________________________ Date ________________

1. Use the plane to the right to complete the following tasks.

   a. Draw a line $\boldsymbol{s}$ whose rule is x *is always 5*.

   b. Plot the points from Table A on the grid in order. Then, draw line segments to connect the points in order.

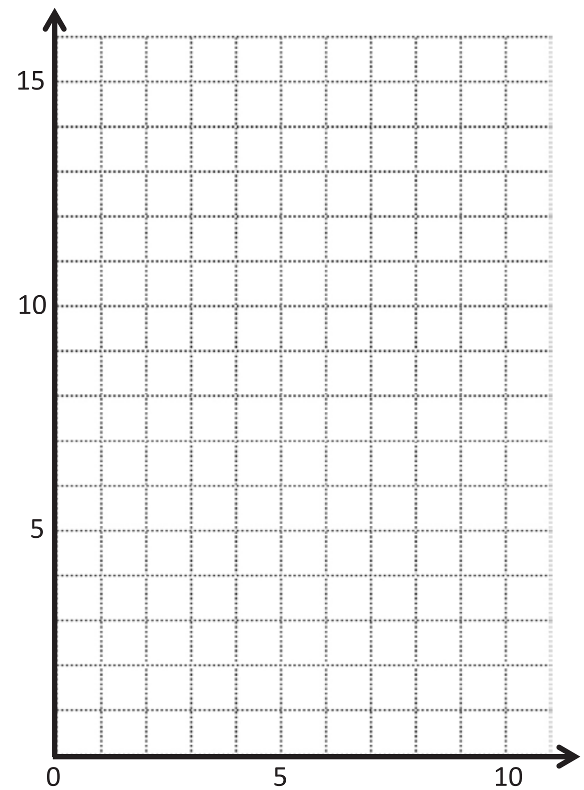


Table A

(x, y)
(1, 13)
(1, 12)
(2, 10)
(4, 9)
(4, 3)
(1, 2)
(5, 2)

Table B

(x, y)

   c. Complete the drawing to create a figure that is symmetric about line $\boldsymbol{s}$. For each point in Table A, record the symmetric point on the other side of $\boldsymbol{s}$.

   d. Compare the y-coordinates in Table A with those in Table B. What do you notice?

   e. Compare the x-coordinates in Table A with those in Table B. What do you notice?

2. Use the plane to the right to complete the following tasks.

   a. Draw a line $\boldsymbol{p}$ whose rule is, y *is equal to* x.

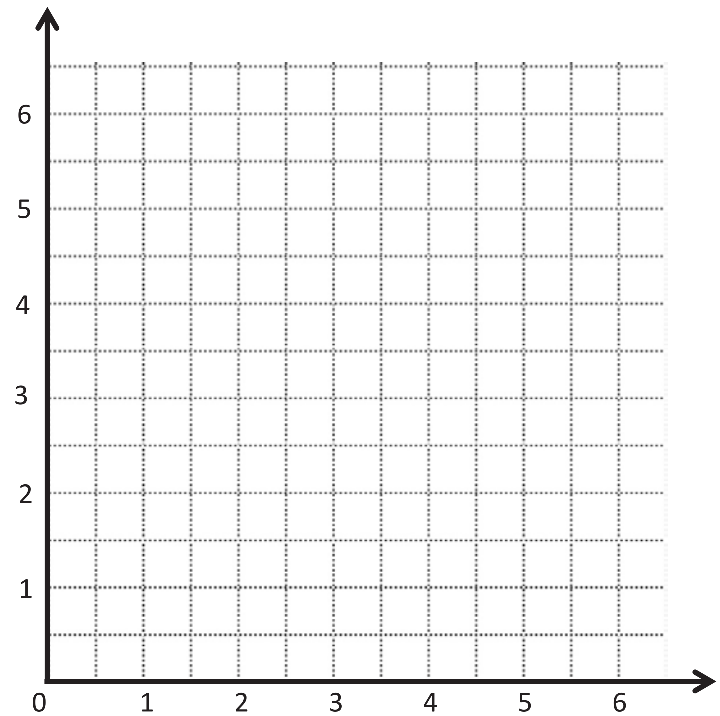
   b. Plot the points from Table A on the grid in order. Then, draw line segments to connect the points.

Table A

(x, y)
$(\frac{1}{2}, \frac{1}{2})$
(1, 2)
$(1\frac{1}{2}, 1\frac{1}{2})$
(2, 4)
$(3\frac{1}{2}, 3\frac{1}{2})$
$(4, 4\frac{1}{2})$
(5, 5)

Table B

(x, y)



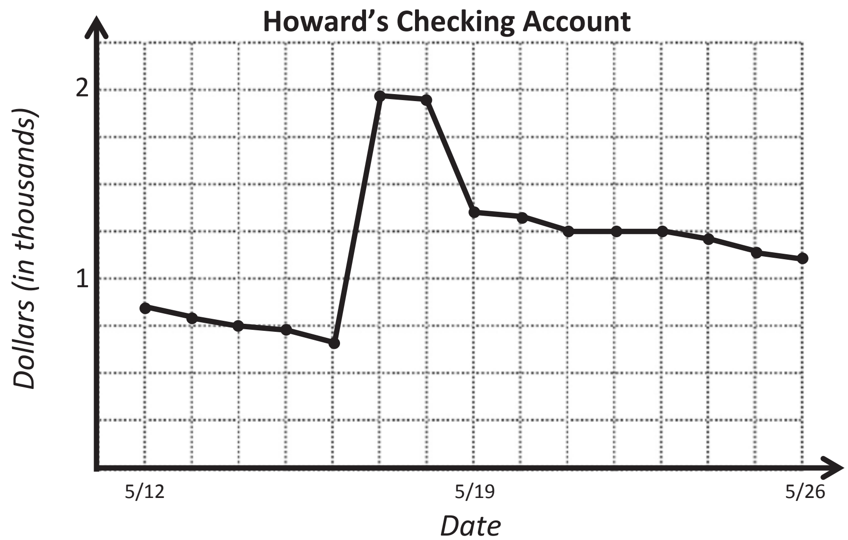
   c. Complete the drawing to create a figure that is symmetric about line $\boldsymbol{p}$. For each point in Table A, record the symmetric point on the other side of the line $\boldsymbol{p}$ in Table B.

   d. Compare the y-coordinates in Table A with those in Table B. What do you notice?

   e. Compare the x-coordinates in Table A with those in Table B. What do you notice?

Name ____ Date ______________________

1. The line graph below tracks the balance of Howard's checking account, at the end of each day, between May 12 and May 26. Use the information in the graph to answer the questions that follow.



a. About how much money does Howard have in his checking account on May 21?

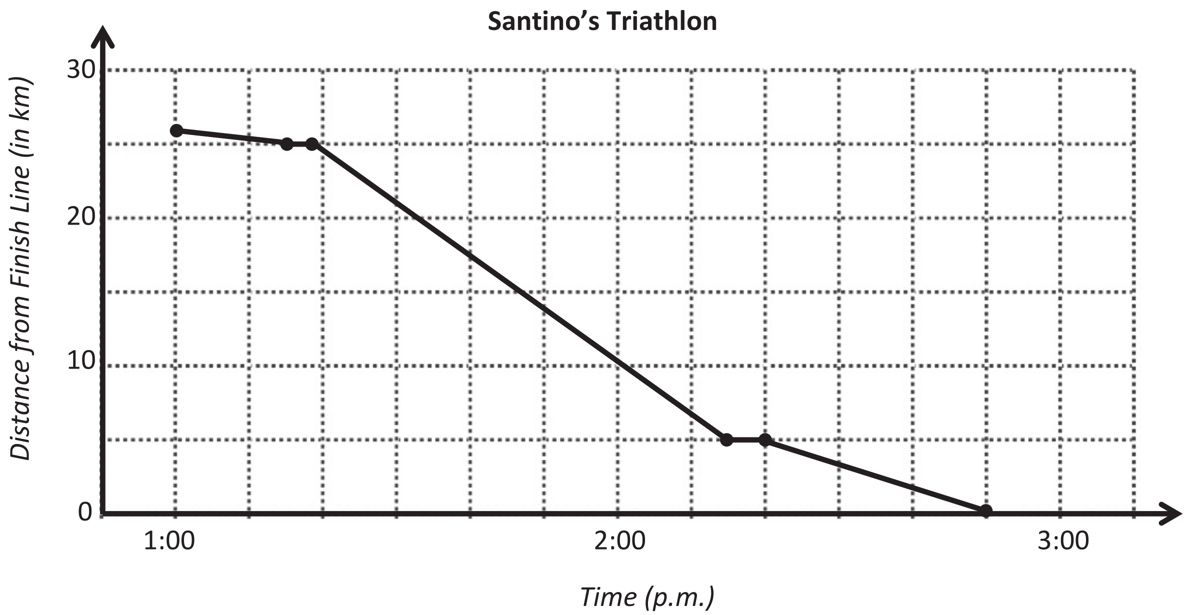
b. If Howard spends $250 from his checking account on May 26, about how much money will he have left in his account?

c. Explain what happened with Howard's money between May 21 and May 23.

d. Howard received a payment from his job that went directly into his checking account. On which day did this most likely occur? Explain how you know.

e. Howard bought a new television during the time shown in the graph. On which day did this most likely occur? Explain how you know.

2. The line graph below tracks Santino's time at the beginning and end of each part of a triathlon. Use the information in the graph to answer the questions that follow.



a. How long does it take Santino to finish the triathlon?

b. To complete the triathlon, Santino first swims across a lake, then bikes through the city, and finishes by running around the lake. According to the graph, what was the distance of the running portion of the race?

c. During the race, Santino pauses to put on his biking shoes and helmet, and then later to change into his running shoes. At what times did this most likely occur? Explain how you know.

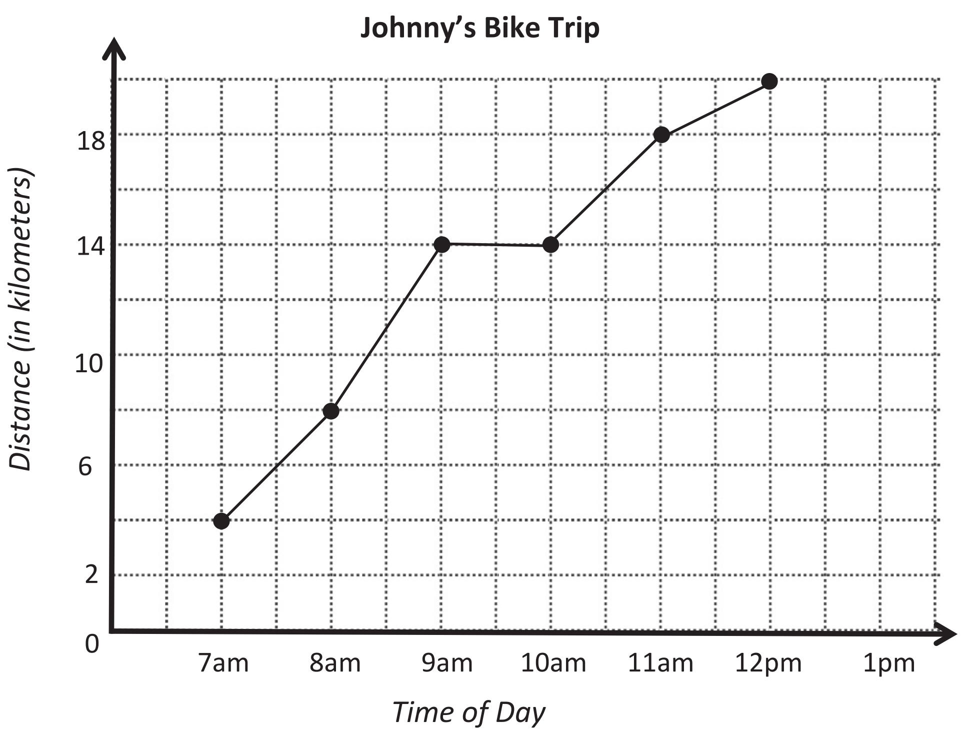
d. Which part of the race does Santino finish most quickly? How do you know?

e. During which part of the triathlon is Santino racing most quickly? Explain how you know.

Name ______________________________ Date ________________

Use the graph to answer the questions.

Johnny left his home at 6 a.m. and kept track of the number of kilometers he traveled at the end of each hour of his trip. He recorded the data in a line graph.



a. How far did Johnny travel in all? How long did it take?

b. Johnny took a one-hour break to have a snack and take some pictures. What time did he stop? How do you know?

c. Did Johnny cover more distance before his break or after? Explain.

d. Between which two hours did Johnny ride 4 kilometers?

e. During which hour did Johnny ride the fastest? Explain how you know.

Name ______________________________ Date ________________

1. Sara travels twice as far as Eli when going to camp. Ashley travels as far as Sara and Eli together. Hazel travels 3 times as far as Sara. In total, all four travel 888 miles to camp. How far does each of them travel?

The following problem is a brainteaser for your enjoyment. It is intended to encourage working together and family problem-solving fun. It is not a required element of this homework assignment.

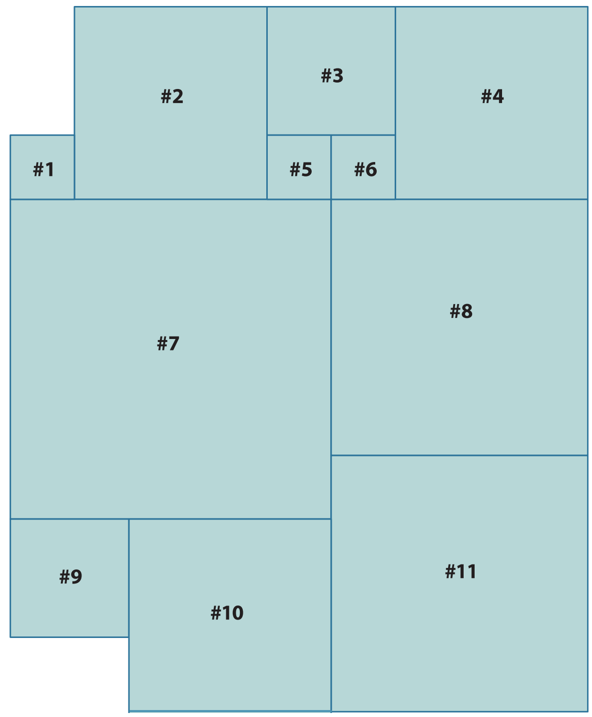
2. A man wants to take a goat, a bag of cabbage, and a wolf over to an island. His boat will only hold him and one animal or item. If the goat is left with the cabbage, he'll eat it. If the wolf is left with the goat, he'll eat it. How can the man transport all three to the island without anything being eaten?

Name ______________________________ Date ______________

Solve using any method. Show all your thinking.

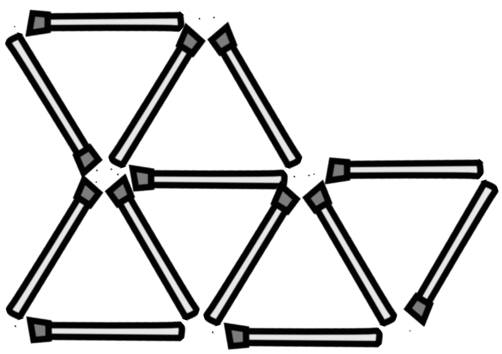
1. Study this diagram showing all squares. Fill in the table.

Figure	Area in Square Feet
1	1 ft^2
2	
3	
4	9 ft^2
5	
6	1 ft^2
7	
8	
9	
10	
11	



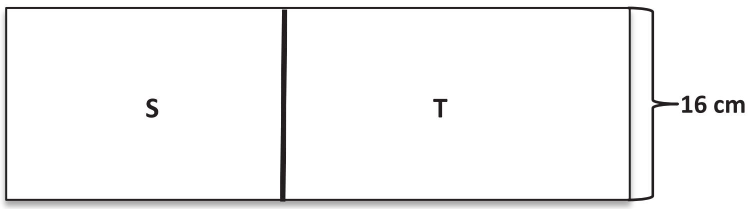
The following problem is a brainteaser for your enjoyment. It is intended to encourage working together and family problem-solving fun. It is not a required element of this homework assignment.

2. Remove 3 matches to leave 3 triangles.



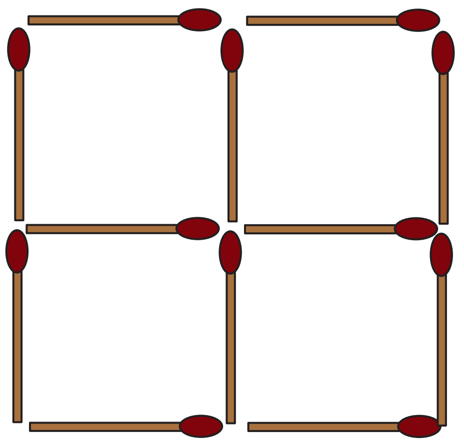
Name ____ Date ____________________

1. In the diagram, the length of Figure S is $\frac{2}{3}$ the length of Figure T. If S has an area of 368 cm^2, find the perimeter of the figure.

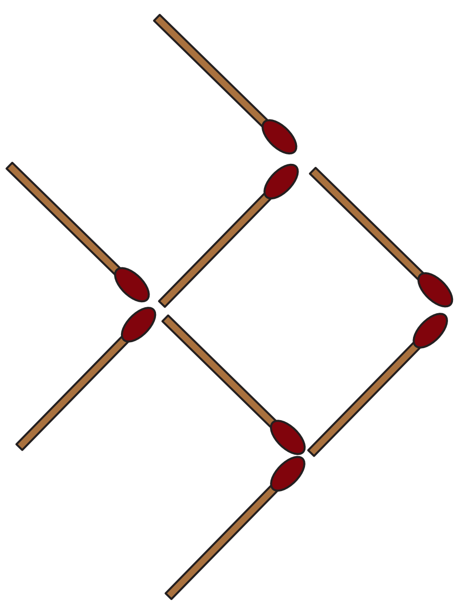


The following problems are puzzles for your enjoyment. They are intended to encourage working together and family problem-solving fun and are not a required element of this homework assignment.

2. Take 12 matchsticks arranged in a grid as shown below, and remove 2 matchsticks so 2 squares remain. How can you do this? Draw the new arrangement.



3. Moving only 3 matchsticks makes the fish turn around and swim the opposite way. Which matchsticks did you move? Draw the new shape.

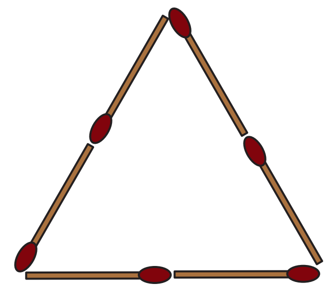


Name ______________________________ Date ________________

1. Pat's Potato Farm grew 490 pounds of potatoes. Pat delivered $\frac{3}{7}$ of the potatoes to a vegetable stand. The owner of the vegetable stand delivered $\frac{2}{3}$ of the potatoes he bought to a local grocery store, which packaged half of the potatoes that were delivered into 5-pound bags. How many 5-pound bags did the grocery store package?

The following problems are for your enjoyment. They are intended to encourage working together and family problem-solving fun. They are not a required element of this homework assignment.

2. Six matchsticks are arranged into an equilateral triangle. How can you arrange them into 4 equilateral triangles without breaking or overlapping any of them? Draw the new shape.



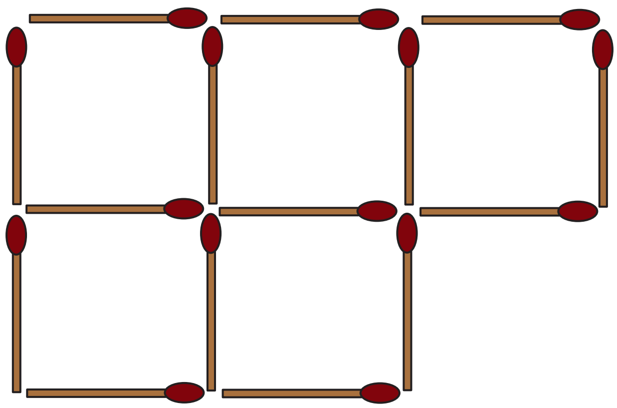
3. Kenny's dog, Charlie, is really smart! Last week, Charlie buried 7 bones in all. He buried them in 5 straight lines and put 3 bones in each line. How is this possible? Sketch how Charlie buried the bones.

Name ____ Date ______________________

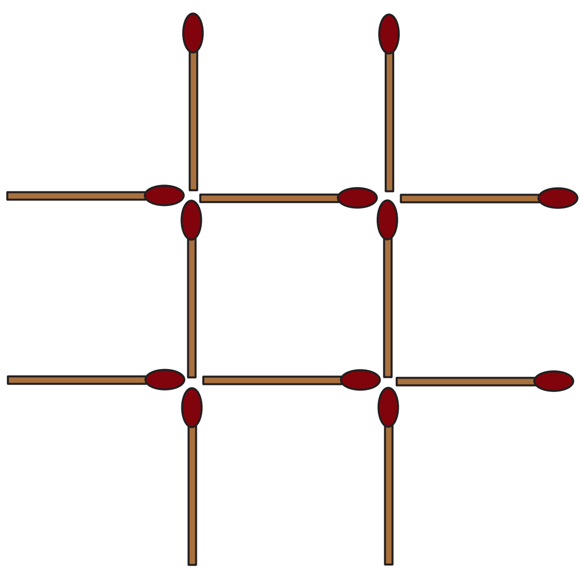
1. Fred and Ethyl had 132 flowers altogether at first. After Fred sold $\frac{1}{4}$ of his flowers and Ethyl sold 48 of her flowers, they had the same number of flowers left. How many flowers did each of them have at first?

The following problems are puzzles for your enjoyment. They are intended to encourage working together and family problem-solving fun. They are not a required element of this homework assignment.

2. Without removing any, move 2 matchsticks to make 4 identical squares. Which matchsticks did you move? Draw the new shape.



3. Move 3 matchsticks to form exactly (and only) 3 identical squares. Which matchsticks did you move? Draw the new shape.



Name ____ Date ______________________

1. For each written phrase, write a numerical expression, and then evaluate your expression.

   a. Forty times the sum of forty-three and fifty-seven

   Numerical expression:

   Solution:

   b. Divide the difference between one thousand three hundred and nine hundred fifty by four

   Numerical expression:

   Solution:

   c. Seven times the quotient of five and seven

   Numerical expression:

   Solution:

   d. One fourth the difference of four sixths and three twelfths

   Numerical expression:

   Solution:

2. Write at least 2 numerical expressions for each written phrase below. Then, solve.

   a. Three fifths of seven

   b. One sixth the product of four and eight

3. Use <, >, or = to make true number sentences without calculating. Explain your thinking.

   a. 4 tenths + 3 tens + 1 thousandth ◯ 30.41

   b. $\left(5 \times \frac{1}{10}\right) + \left(7 \times \frac{1}{1000}\right)$ ◯ 0.507

   c. 8×7.20 ◯ $8 \times 4.36 + 8 \times 3.59$

Name ____ Date ______________________

1. Use the RDW process to solve the word problems below.

   a. There are 36 students in Mr. Meyer's class. Of those students, $\frac{5}{12}$ played tag at recess, $\frac{1}{3}$ played kickball, and the rest played basketball. How many students in Mr. Meyer's class played basketball?

   b. Julie brought 24 apples to school to share with her classmates. Of those apples, $\frac{2}{3}$ are red and the rest are green. Julie's classmates ate $\frac{3}{4}$ of the red apples and $\frac{1}{2}$ of the green apples. How many apples are left?

2. Write and solve a word problem for each expression in the chart below.

Expression	Word Problem	Solution
$144 \times \frac{7}{12}$		
$9 - \left(\frac{4}{9} + \frac{1}{3}\right)$		
$\frac{3}{4} \times (36 + 12)$		

Name ______________________________ Date ________________

1. Use what you learned about your fluency skills today to answer the questions below.

   a. Which skills should you practice this summer to maintain and build your fluency? Why?

   b. Write a goal for yourself about a skill that you want to work on this summer.

   c. Explain the steps you can take to reach your goal.

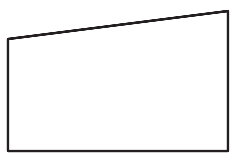
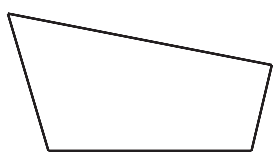
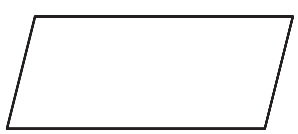
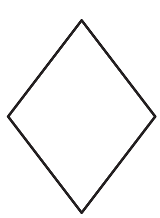
   d. How will reaching this goal help you as a math student?

2. In the chart below, plan a new fluency activity that you can play at home this summer to help you build or maintain a skill that you listed in Problem 1(a). When planning your activity, be sure to think about the factors listed below:
   - The materials that you'll need.
   - Who can play with you (if more than 1 player is needed).
   - The usefulness of the activity for building your skills.

Skill:
Name of Activity:
Materials Needed:
Description:

Name ______________________________ Date ________________

1. Use your ruler, protractor, and set square to help you give as many names as possible for each figure below. Then, explain your reasoning for how you named each figure.

Figure	Names	Reasoning for Names
a. 		
b. 		
c. 		
d. 		

2. Mark draws a figure that has the following characteristics:
   - Exactly 4 sides that are each 7 centimeters long
   - Two sets of parallel lines
   - Exactly 4 angles that measure 35 degrees, 145 degrees, 35 degrees, and 145 degrees

   a. Draw and label Mark's figure below.

   b. Give as many names of quadrilaterals as possible for Mark's figure. Explain your reasoning for the names of Mark's figure.

   c. List the names of Mark's figure in Problem 2(b) in order from least specific to most specific. Explain your thinking.

Name ____ Date ______________________

Teach someone at home how to play one of the games you played today with your pictorial vocabulary cards. Then, answer the questions below.

1. What games did you play?

2. Who played the games with you?

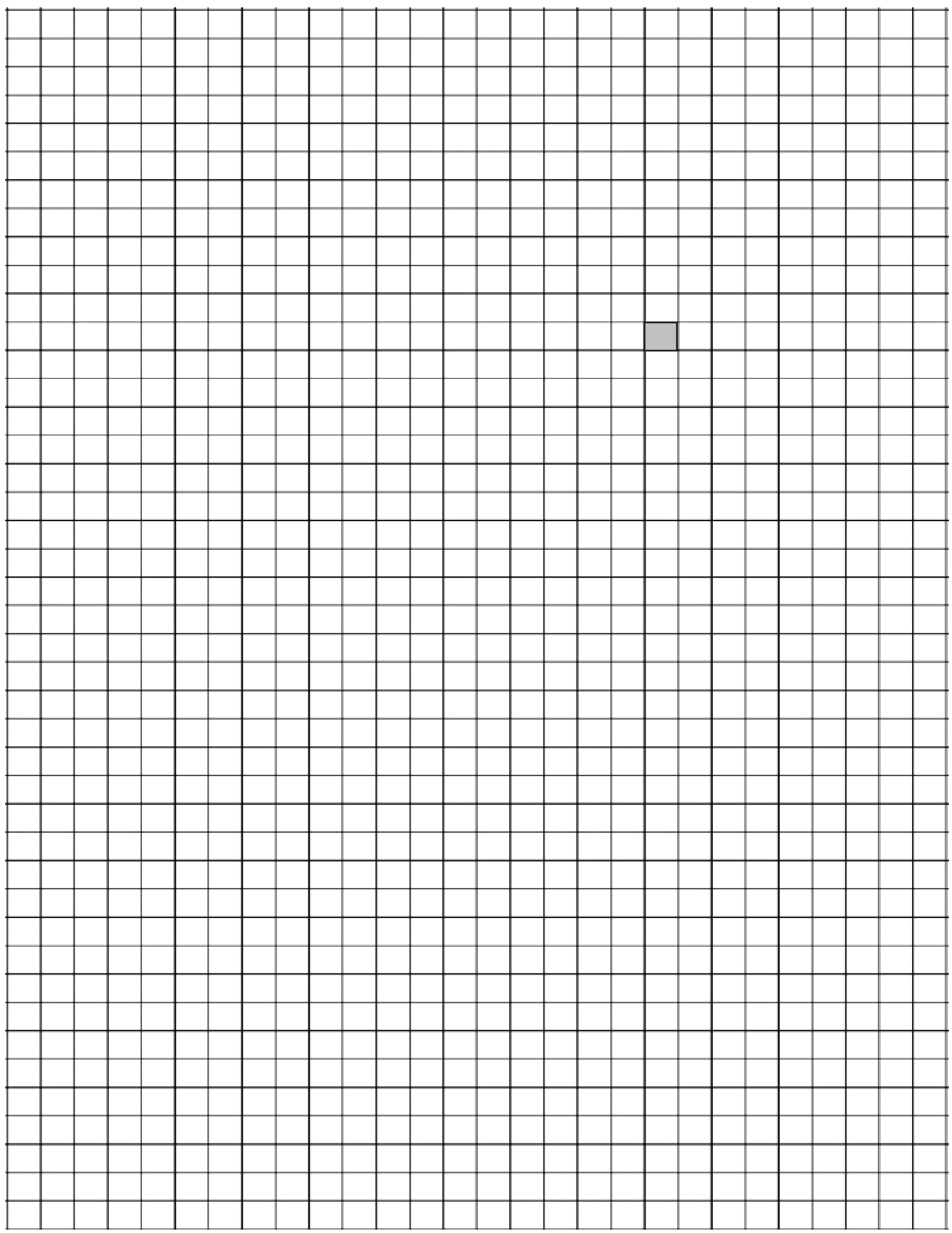
3. What was it like to teach someone at home how to play?

4. Did you have to teach the person who played with you any of the math concepts before you could play? Which ones? What was that like?

5. When you play these games at home again, what changes will you make? Why?

Name ____ Date ______________________

1. List the Fibonacci numbers up to 21, and create, on the graph below, a spiral of squares corresponding to each of the numbers you write.



2. In the space below, write a rule that generates the Fibonacci sequence.

3. Write at least the first 15 numbers of the Fibonacci sequence.

Name ______________________________ Date ________________

1. Jonas played with the Fibonacci sequence he learned in class. Complete the table he started.

1	2	3	4	5	6	7	8	9	10
1	1	2	3	5	8				

11	12	13	14	15	16	17	18	19	20

2. As he looked at the numbers, Jonas realized he could play with them. He took two consecutive numbers in the pattern and multiplied them by themselves and then added them together. He found they made another number in the pattern. For example, (3 × 3) + (2 × 2) = 13, another number in the pattern. Jonas said this was true for any two consecutive Fibonacci numbers. Was Jonas correct? Show your reasoning by giving at least two examples of why he was or was not correct.

3. Fibonacci numbers can be found in many places in nature. For example, the number of petals in a daisy, the number of spirals in a pine cone or a pineapple, and even the way branches grow on a tree. Find an example of something natural where you can see a Fibonacci number in action, and sketch it here.

Name ____ Date ______________________

1. Find various rectangular boxes at your home. Use a ruler to measure the dimensions of each box to the nearest centimeter. Then, calculate the volume of each box. The first one is partially done for you.

Item	Length	Width	Height	Volume
Juice Box	11 cm	2 cm	5 cm	

2. The dimensions of a small juice box are 11 cm by 4 cm by 7 cm. The super-size juice box has the same height of 11 cm but double the volume. Give two sets of the possible dimensions of the super-size juice box and the volume.

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