Name _____

Line Plots

A **line plot** is a graph that shows the shape of a data set by placing *X*s above each data value on a number line. You can make a line plot to represent a data set and then use the line plot to answer questions about the data set.

Students measure the lengths of several seeds.
The length of each seed is listed below.

$\frac{1}{2}$ inch, $\frac{3}{4}$ inch, $\frac{1}{2}$ inch, $\frac{1}{4}$ inch, $\frac{3}{4}$ inch, $\frac{3}{4}$ inch, $\frac{3}{4}$ inch, $\frac{1}{4}$ inch, $\frac{1}{2}$ inch

What is the combined length of the seeds that are $\frac{1}{4}$ inch long?

Step 1 To represent the different lengths of the seeds, draw and label a line plot with the data values $\frac{1}{4}$, $\frac{1}{2}$, and $\frac{3}{4}$. Then use an *X* to represent each seed. The line plot has been started for you.

Length of Seeds (in inches)
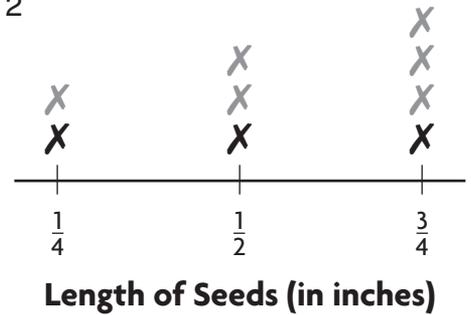
Step 2 There are ___2___ *X*s above $\frac{1}{4}$ on the line plot.

Multiply to find the combined length of the seeds:

___2___ × ___$\frac{1}{4}$___ = ___$\frac{2}{4}$, or $\frac{1}{2}$___ inch

The combined length of the seeds that are $\frac{1}{4}$ inch long is $\frac{1}{2}$ inch.

You can use the same process to find the combined lengths of the seeds that are $\frac{1}{2}$ inch long and $\frac{3}{4}$ inch long.

Use the data and the line plot above to answer the questions.

1. What is the total length of all the seeds that the students measured?

2. What is the average length of one of the seeds that the students measured?

Ordered Pairs

A coordinate grid is like a sheet of graph paper bordered at the left and at the bottom by two perpendicular number lines. The **x-axis** is the horizontal number line at the bottom of the grid. The **y-axis** is the vertical number line on the left side of the grid.

An ordered pair is a pair of numbers that describes the location of a point on the grid. An ordered pair contains two coordinates, x and y. The **x-coordinate** is the first number in the ordered pair, and the **y-coordinate** is the second number.

$(x, y) \longrightarrow (10, 4)$

Plot and label (10, 4) on the coordinate grid.

To graph an ordered pair:

- Start at the origin, (0, 0).

- Think: The letter x comes before y in the alphabet. Move across the x-axis first.

- The x-coordinate is 10, so move 10 units right.

- The y-coordinate is 4, so move 4 units up.
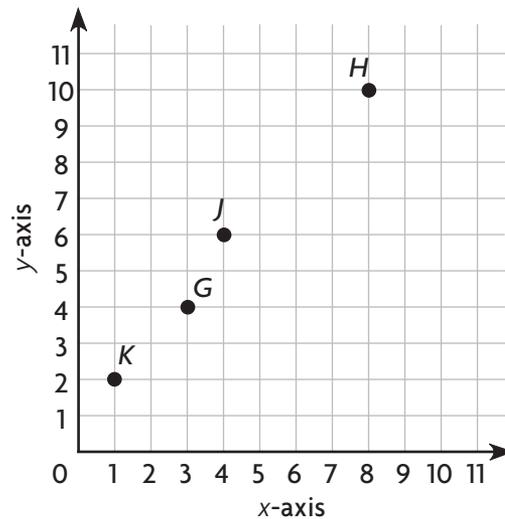
- Plot and label the ordered pair (10, 4).
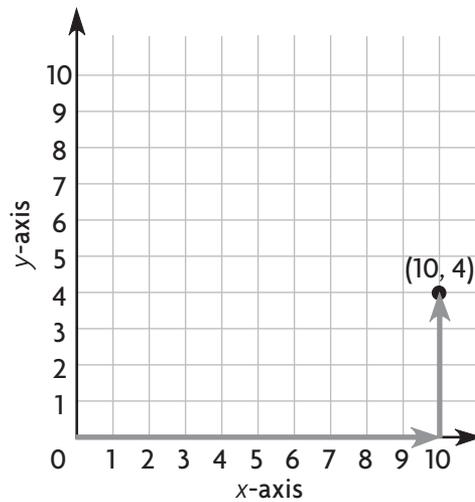
Use the coordinate grid to write an ordered pair for the given point.

1. G _____

2. H _____

3. J _____

4. K _____

Plot and label the points on the coordinate grid.

5. A (1, 6)

6. B (1, 9)

7. C (3, 7)

8. D (5, 5)

9. E (9, 3)

10. F (6, 2)

Graph Data

Graph the data on the coordinate grid.

Plant Growth				
End of Week	1	2	3	4
Height (in inches)	4	7	10	11

- Choose a title for your graph and label it. You can use the data categories to name the *x*- and *y*-axis.

- Write the related pairs of data as ordered pairs.

 (__1__, __4__), (__2__, __7__)

 (__3__, __10__), (__4__, __11__)

- Plot the point for each ordered pair.

Plant Growth

Height (in inches) / *y*-axis

x-axis
End of Week
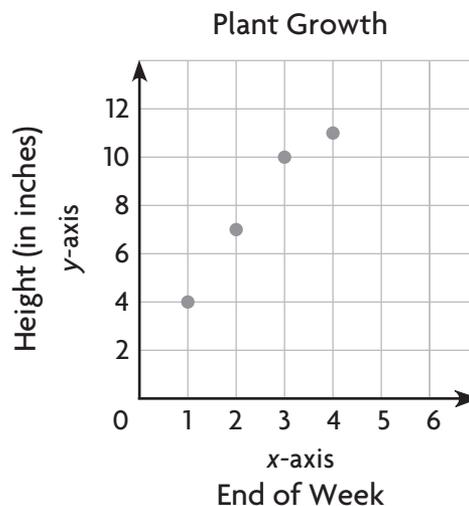
Graph the data on the coordinate grid. Label the points.

1.

Distance of Bike Ride				
Time (in minutes)	30	60	90	120
Distance (in miles)	9	16	21	27

Write the ordered pair for each point.

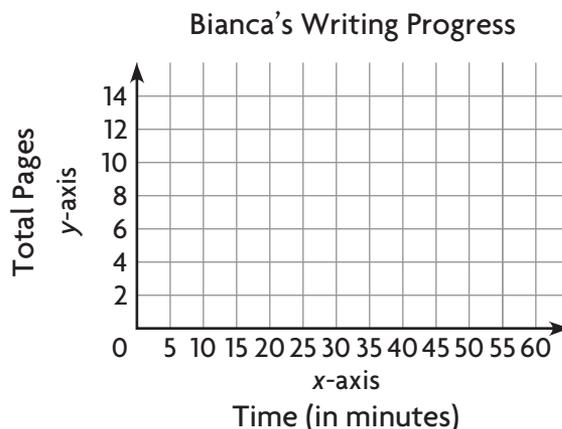(_____, _____), (_____, _____)
(_____, _____), (_____, _____)

Distance of Bike Ride

Distance (in miles) / *y*-axis

x-axis
Time (in minutes)
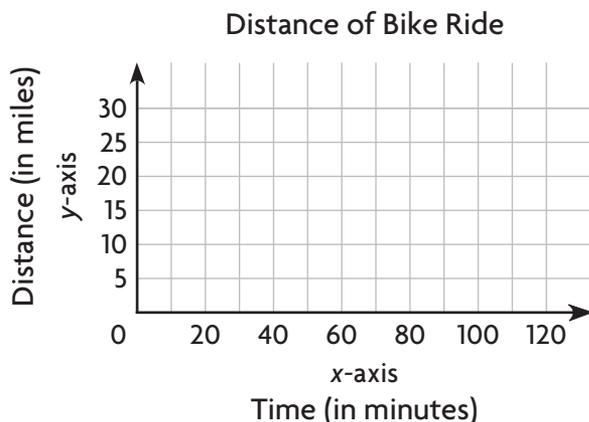
2.

Bianca's Writing Progress				
Time (in minutes)	15	30	45	60
Total Pages	1	3	9	11

Write the ordered pair for each point.

(_____, _____), (_____, _____)
(_____, _____), (_____, _____)

Bianca's Writing Progress

Total Pages / *y*-axis

x-axis
Time (in minutes)

Line Graphs

A **line graph** uses a series of line segments to show how a set of data changes over time. The **scale** of a line graph measures and labels the data along the axes. An **interval** is the distance between the numbers on an axis.

Use the table to make a line graph.

- Write a title for your graph. In this example, use **Average Monthly High Temperature in Sacramento**.

Average Monthly High Temperature in Sacramento, California					
Month	Jan.	Feb.	Mar.	April	May
Temperature (˚F)	53	60	65	71	80

- Draw and label the axes of the line graph. Label the horizontal axis **Month**. Write the months. Label the vertical axis **Temperature (°F)**.

- Choose a scale and an interval. The range is 53–80, so a possible scale is 0–80, with intervals of 20.

- Write the related pairs of data as ordered pairs:
  (Jan, 53); (Feb, 60); (Mar, 65); (April, 71); (May, 80).

1. Make a line graph of the data above.

Average Monthly High Temperature in Sacramento
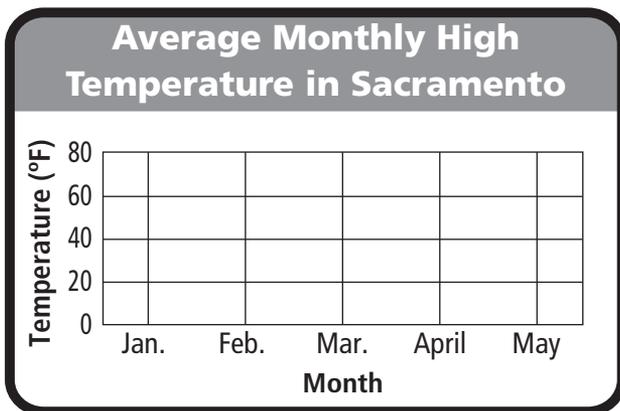
Use the graph to determine between which two months the least change in average high temperature occurs.

_____

_____

2. Make a line graph of the data in the table.

Average Low Temperature in San Diego, California					
Month	Mar.	April	May	June	July
Temperature (ºF)	51	51	60	62	66

Average Low Temperature in San Diego
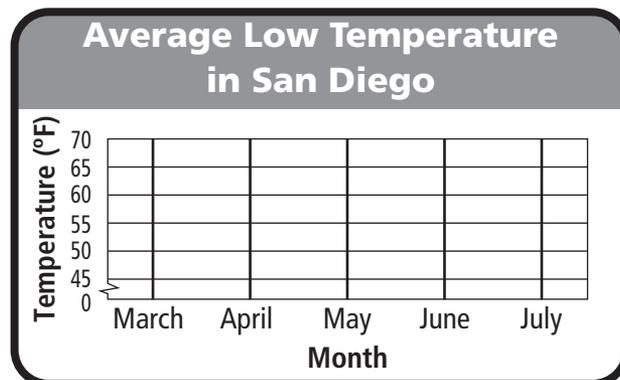
Use the graph to determine between which two months the greatest change in average low temperature occurs.

_____

Numerical Patterns

A soccer league has 7 teams. How many players are needed for 7 teams? How many soccer balls are needed by the 7 teams?

Number of Teams	1	2	3	4	7
Add __8__. Number of Players	8	16	24	32	56
Add __4__. Number of Soccer Balls	4	8	12	16	**28**

Step 1 Find a rule that could be used to find the number of players for the number of teams.

Think: In the sequence 8, 16, 24, 32, you add 8 to get the next term.

As the number of teams increases by 1, the number of players increases by 8. So the rule is to add 8.

Step 2 Find a rule that could be used to find the number of soccer balls for the number of teams.

Think: In the sequence 4, 8, 12, 16, you add 4 to get the next term.

As the number of teams increases by 1, the number of soccer balls needed increases by 4. So the rule is to add 4.

Step 3 For 7 teams, multiply the number of players by $\frac{1}{2}$ to find the number of soccer balls.

So, for 7 teams, 56 players will need __28__ soccer balls.

Complete the rule that describes how one sequence is related to the other. Use the rule to find the unknown term.

Number of Teams	1	2	3	4	8	10
Number of Players	15	30	45	60	120	
Number of Bats	5	10	15	20		50

1. Divide the number of players by _____ to find the number of bats.

2. Multiply the number of bats by _____ to find the number of players.

Problem Solving • Find a Rule

Samantha is making a scarf with fringe around it. Each section of fringe
is made of 4 pieces of yarn with 2 beads holding them together. There are
42 sections of fringe on Samantha's scarf. How many wooden beads and
how many pieces of yarn are on Samantha's scarf?

Read the Problem	Solve the Problem

Read the Problem

What do I need to find?

Possible answer: I need to find
the number of beads and the
number of pieces of yarn on
Samantha's scarf.

What information do I need to use?

Possible answer: I need to use
the number of sections on the
scarf, and that each section
has 4 pieces of yarn and 2
beads.

How will I use the information?

I will use the information to
search for patterns to solve a
simpler problem.

Solve the Problem

Sections of Fringe	1	2	3	4	6	42
Number of Beads	2	4	6	8	12	84
Pieces of Yarn	4	8	12	16	24	168

Possible answer: I can multiply
the number of sections by 2
to find the number of beads.
Then, I can multiply the
number of sections by 4, or the
number of beads by 2, to find
the number of pieces of yarn.
So, Samantha's scarf has 2 ×
42, or 84 beads, and 4 × 42, or
168 pieces of yarn.

1. A rectangular tile has a decorative
pattern of 3 equal-sized squares, each
of which is divided into 2 same-sized
triangles. If Marnie uses 36 of these tiles
on the wall behind her kitchen stove,
how many triangles are displayed?

2. Leta is making strawberry-almond salad
for a party. For every head of lettuce that
she uses, she adds 5 ounces of almonds
and 10 strawberries. If she uses 75
ounces of almonds, how many heads of
lettuce and how many strawberries does
Leta use?

Graph and Analyze Relationships

The scale on a map is 1 in. = 4 mi. Two cities are 5 inches apart on the map. What is the actual distance between the two cities?

Step 1 Make a table that relates the map distances to the actual distances.

Map Distance (in.)	1	2	3	4	5
Actual Distance (mi)	4	8	12	16	_?_

Step 2 Write the number pairs in the table as ordered pairs.

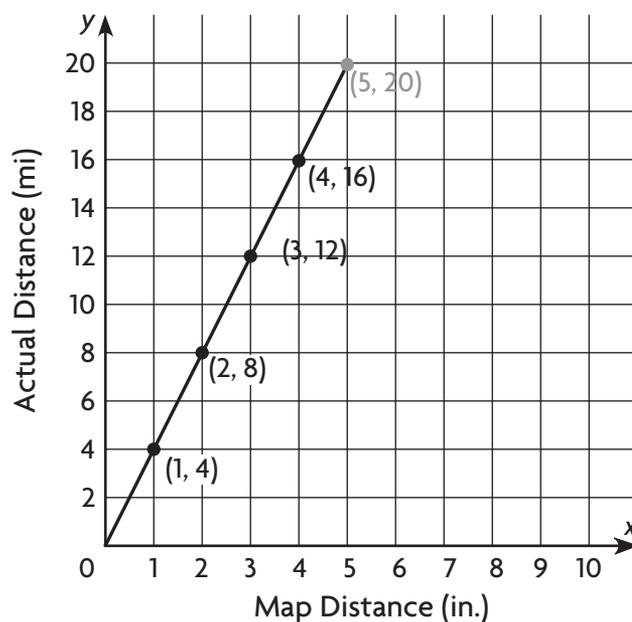(1, 4), (2, 8), (3, 12), (4, 16), (5, ?)

Step 3 Graph the ordered pairs. Connect the points with a line from the origin.

Possible rule: Multiply the map distance by <u>4</u> to get the actual distance.

Step 4 Use the rule to find the actual distance between the two cities.

So, two cities that are 5 inches apart on the map are actually 5 × 4, or <u>20</u> miles apart.

Plot the point (5, 20) on the graph.

Graph and label the related number pairs as ordered pairs. Then complete and use the rule to find the unknown term.

1. Multiply the number of yards by _____ to find the number of feet.

Number of Yards	1	2	3	4	5
Number of Feet	3	6	9	12	