TABLE OF CONTENTS

About *Finish Line New Jersey Math* 5

UNIT 1: Big Ideas from Grade 4 7

LESSON 1 4.NBT.5, 6 **Multiplying and Dividing Whole Numbers** [connects to 5.NBT.5, 6] 8

LESSON 2 4.NF.6, 7 **Understanding Decimals** [connects to 5.NBT.3.a, b] 15

LESSON 3 4.NF.3.a, c, d **Adding and Subtracting Fractions** [connects to 5.NF.1, 2, 6] 23

LESSON 4 4.MD.1 **Finding Equivalent Measurements** [connects to 5.MD.1] 30

UNIT 1 REVIEW 38

UNIT 2: Number and Operations in Base Ten 42

LESSON 5 5.NBT.1 **Whole-Number Place Value** 43

LESSON 6 5.NBT.2 **Powers of Ten** 50

LESSON 7 5.NBT.1, 3.a **Decimal Names and Place Value** 57

LESSON 8 5.NBT.3.b **Comparing Decimals** 64

LESSON 9 5.NBT.4 **Rounding Decimals** 71

LESSON 10 5.NBT.5 **Multiplying Whole Numbers** 78

LESSON 11 5.NBT.6 **Dividing Whole Numbers** 85

LESSON 12 5.NBT.7 **Adding and Subtracting Decimals** 92

LESSON 13 5.NBT.7 **Multiplying Decimals** 99

LESSON 14 5.NBT.7 **Dividing Decimals** 107

UNIT 2 REVIEW 116

UNIT 3: Operations and Algebraic Thinking 120

LESSON 15 5.OA.1, 2 **Understanding and Writing Expressions** 121

LESSON 16 5.OA.1 **Evaluating Expressions** 128

LESSON 17 5.OA.3 **Patterns and Relationships** 135

UNIT 3 REVIEW 144

UNIT 4: Number and Operations—Fractions 149

LESSON 18 5.NF.1 **Adding and Subtracting Fractions with Unlike Denominators** 150

LESSON 19 5.NF.2 **Word Problems with Addition and Subtraction of Fractions** 158

LESSON 20 5.NF.3 **Connecting Fractions and Division** 165

LESSON 21 5.NF.4.a, b **Multiplying Whole Numbers and Fractions** 172

LESSON 22 5.NF.4.a, b **Multiplying Fractions** 178

LESSON 23 5.NF.5.a, b **Multiplication and Scale** 185

LESSON 24 5.NF.6 **Word Problems with Multiplication of Fractions** 192

LESSON 25 5.NF.7.a, b **Dividing with Unit Fractions** 199

LESSON 26 5.NF.7.c **Word Problems with Division and Fractions** 206

UNIT 4 REVIEW 213

UNIT 5: Measurement and Data 218

LESSON 27 5.MD.1 **Measurement Conversions** 219

LESSON 28 5.MD.2 **Measurement Data on Line Plots** 228

LESSON 29 5.MD.3.a, b; 4 **Understanding Volume** 237

LESSON 30 5.MD.5.a, b **Volume of Rectangular Prisms** 244

LESSON 31 5.MD.5.c **Volume of Irregular Figures** 252

UNIT 5 REVIEW 260

UNIT 6: Geometry 265

LESSON 32 5.G.1 **Using the Coordinate Plane** 266

LESSON 33 5.G.2 **Solving Problems with the Coordinate Plane** 274

LESSON 34 5.G.3 **Properties of Two-Dimensional Figures** 282

LESSON 35 5.G.4 **Classifying Two-Dimensional Figures** 291

UNIT 6 REVIEW 300

Glossary 305

Flash Cards 313

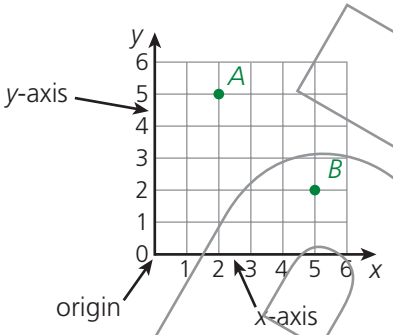
LESSON
32 Using the Coordinate Plane

CCSS: 5.G.1

PART 1 Introduction

A **coordinate plane** is made of two number lines, or **axes.** One is horizontal and is called the ***x*-axis.** The other is vertical and is called the ***y*-axis.** The number lines intersect at the **origin,** or (0, 0).

Vertical means up and down. *Horizontal* means across.



Each point is described by an **ordered pair.** The coordinates in the ordered pair identify the location of the point on the coordinate plane. The ***x*-coordinate** is the first number. It tells the distance from 0, moving right. The ***y*-coordinate** is the second number. It tells the distance from 0, moving up.

Ordered pairs are always in the same order.

(*x*, *y*)

Look at point *A* on the coordinate plane above. Its ordered pair is (2, 5). Move 2 units right from 0. Then move 5 units up.

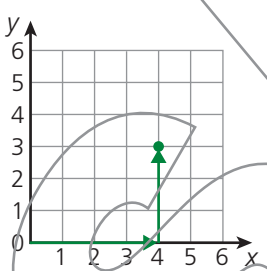
Look at point *B*. Its ordered pair is (5, 2). Move 5 units right from 0. Then move 2 units up.

Use an ordered pair to plot a point on a coordinate plane.

The *x*-coordinate moves right.

The *y*-coordinate moves up.

Plot a point at (4, 3) on the coordinate plane.



Look at the ordered pair (4, 3).

The *x*-coordinate is 4, so move 4 units to the right along the *x*-axis.

The *y*-coordinate is 3, so move 3 units up.

SAMPLE

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Think About It

Are the points at (2, 3) and (3, 2) at the same place on a coordinate plane? Explain how you know.

_____

_____

PART 2 Focused Instruction

Sometimes ordered pairs are given in a table. The number in the *x*-column is the *x*-coordinate. The number beside it in the *y*-column is the *y*-coordinate. It may help you to rewrite them as an ordered pair.

➤ Peter graphs the points shown in the table on a coordinate plane.

x	*y*
0	3
1	4
2	5

Write the data from the table as a set of ordered pairs.

_____

In the first ordered pair, how far along the *x*-axis should Peter move for the *x*-coordinate?

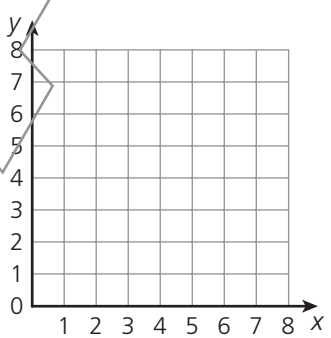
Does the *x*-coordinate tell you to move up or to the right?

_____

In the first ordered pair, how far along the *y*-axis should Peter move for the *y*-coordinate?

_____

Plot the point for (0, 3) on the coordinate plane below. Label it *A*.



SAMPLE

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Look at point *A*. What do you think will always be true if the *x*-coordinate is 0?

_____

Explain how to graph the next two ordered pairs. Label them *B* and *C*.

_____

_____

_____

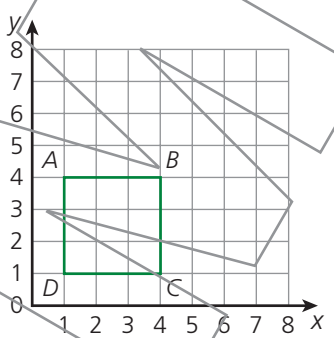
Graph the ordered pairs on the coordinate plane on page 267.

Connect the points. What kind of line do the points make?

_____

Points on a coordinate plane can be connected to form lines and shapes.

➤ The coordinate plane shows a square with points *A*, *B*, *C*, and *D*. What is the location of each point on the coordinate plane?



When graphing a point, in which direction do you move first?

_____

Which axis do you move along first when writing an ordered pair for a point? _____

Ordered pairs:
(*x*, *y*)

SAMPLE

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From 0, how many units to the right should you move to get to point *A*?

_____

From the *x*-axis, how many units up should you move to get to point *A*?

_____

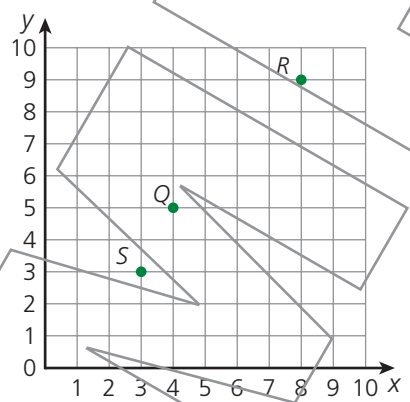
What is the ordered pair that describes the location of point *A*? _____

What is the ordered pair that describes the location of point *B*? _____

What is the ordered pair that describes the location of point *C*? _____

What is the ordered pair that describes the location of point *D*? _____

Use what you know about coordinate planes to find the ordered pairs that describes the points on the coordinate plane.



1 *Q* _____

2 *R* _____

3 *S* _____

SAMPLE

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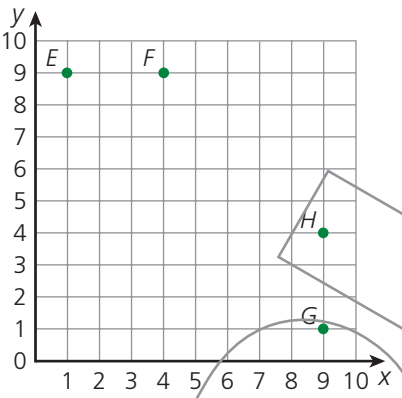
Solve the following problems.

1 Which point is located at (9, 4)?



Coordinate pairs are in the order of (*x*, *y*).

Answer _____

2 Describe how to graph a point at (5, 6) on a coordinate plane.

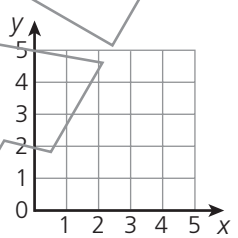
_____

_____

_____

Which way do you move for the first number in an ordered pair?

3 On the coordinate plane below, draw a line segment with an endpoint *M* at (3, 5) and an endpoint *N* at (2, 1). Label each of the endpoints.



A line segment is part of a line with two endpoints. It is straight.

SAMPLE

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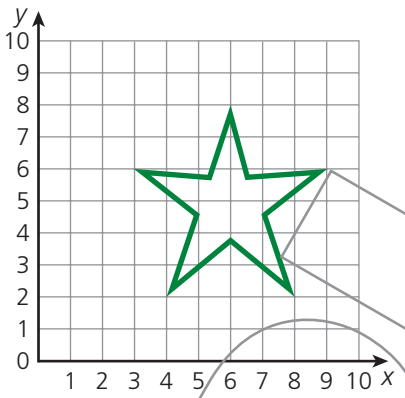
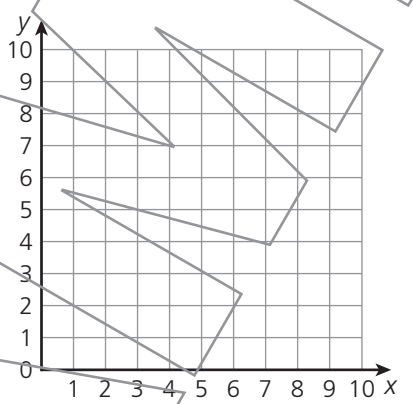
Solve the following problems.

1 What is the location of the top point of the star?



Answer _____

2 Use the coordinate plane to draw a line that passes through point *W* at (7, 0) and point *X* at (3, 4). Label each point.



SAMPLE

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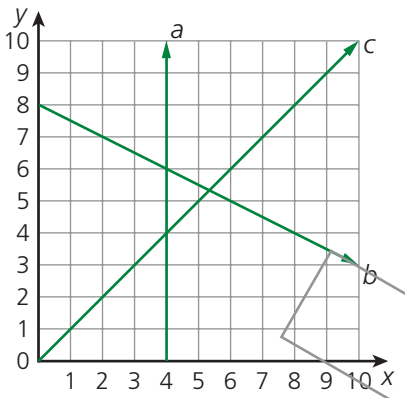
Use the coordinate plane below to answer problems 3–5.



3 What ordered pair describes the location at which lines *a* and *b* meet?

Answer _____

4 Select an option in the set to make the following statement true.

For all the points on line *a*, the [*x*-coordinate, *y*-coordinate] is always 4.

5 Explain how one line can be moved so that all three lines will meet at the same point.

_____

_____

SAMPLE

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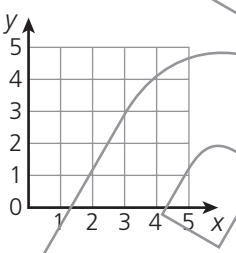
6 The list below shows the ordered pairs for some points.

- *A* (2, 3)
- *B* (3, 2)
- *C* (3, 3)
- *D* (2, 2)
- *E* (3, 1)

Part A Graph the points from the list on the coordinate plane below.



Part B A triangle is formed on the coordinate plane above. Its vertices are at (2, 1), (2, 4), and (4, 1). Which of the points that you graphed in Part A do not lie on one of the sides of this triangle? Explain your reasoning.

SAMPLE

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