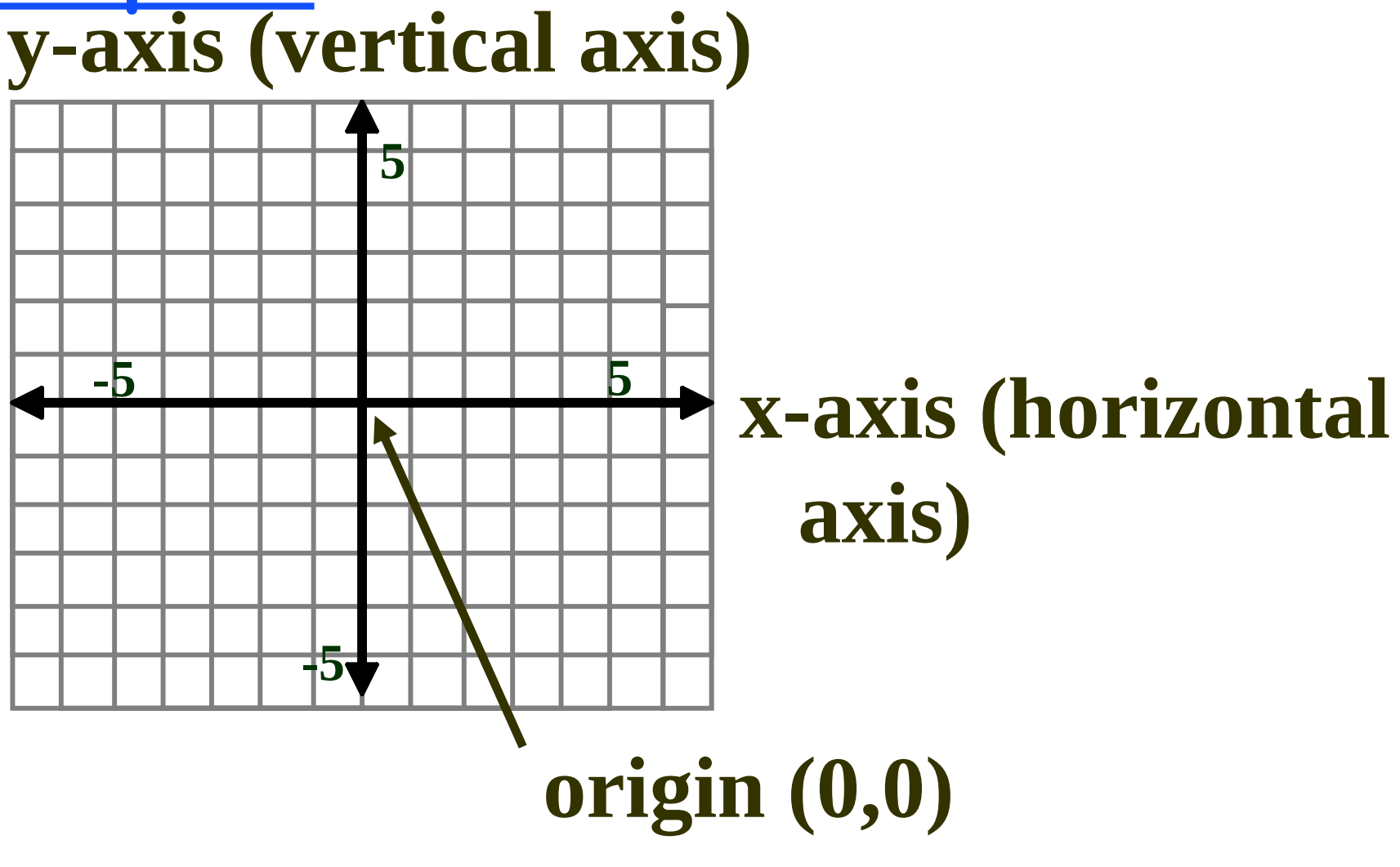
Chapter 5

Expressions and Functions (selected topics)

5.1C Ordered Pairs and Relations

Main Idea: Graph ordered pairs on the coordinate plane and use the coordinate plane to represent relations.

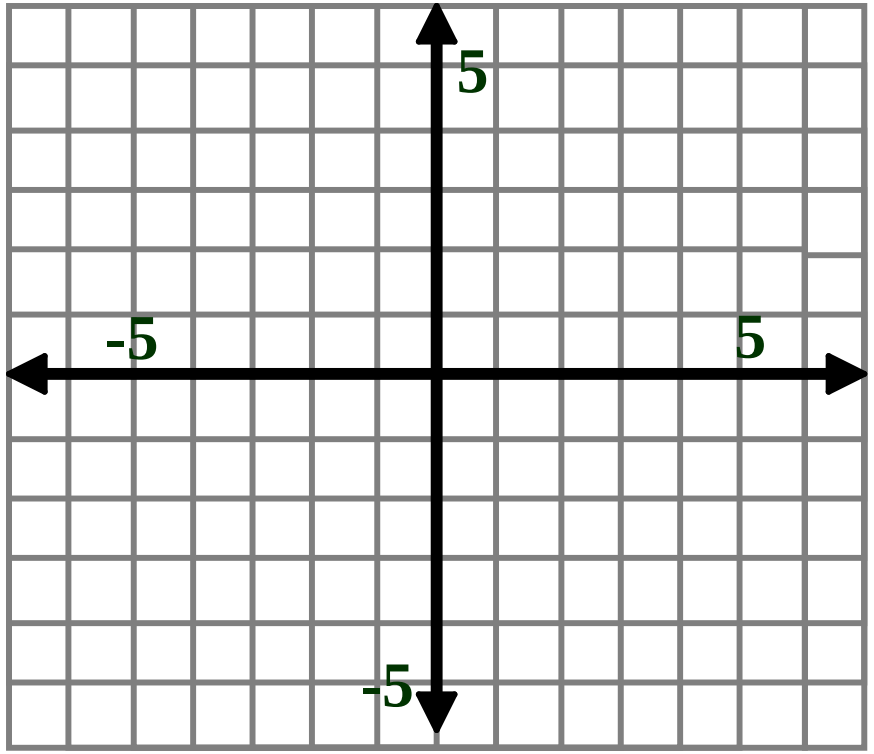
Ordered pairs are used to locate points in a coordinate plane.



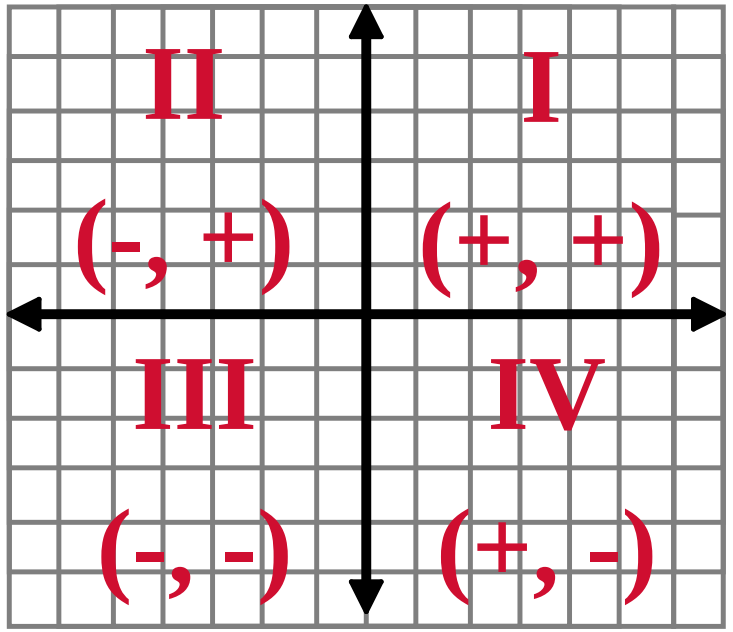
In an ordered pair, the first number is the **x-coordinate**. The second number is the **y-coordinate**.

(x, y)

Graph :

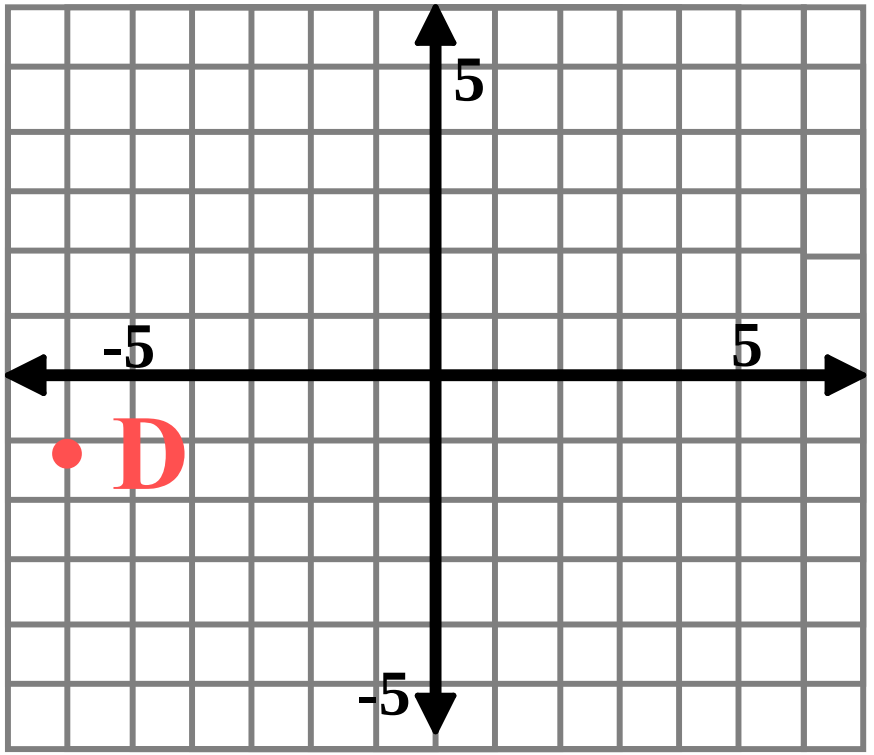


The x-axis and y-axis separate the coordinate plane into four regions, called **quadrants**.



What is the ordered pair for D?

1. (-1, -6)
2. (-6, -1)
3. (-6, 1)
4. (6, -1)



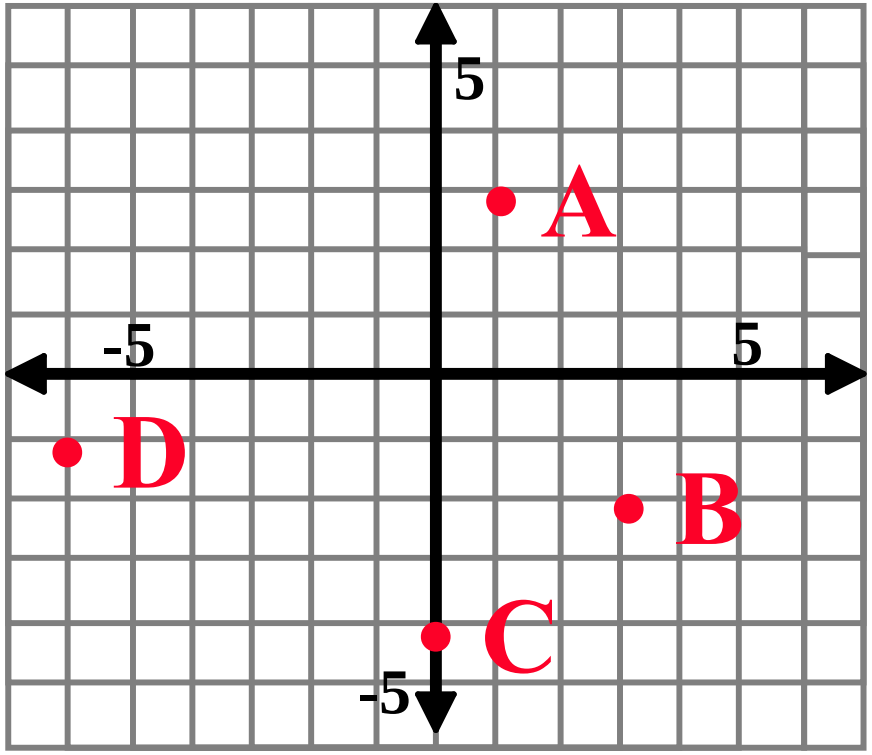
Write the ordered pairs that name points A, B, C, and D.

A =

B =

C =

D =



Vocabulary:

- Relation – any set of ordered pairs
- Domain – set of x-coordinates
- Range – set of y-coordinates

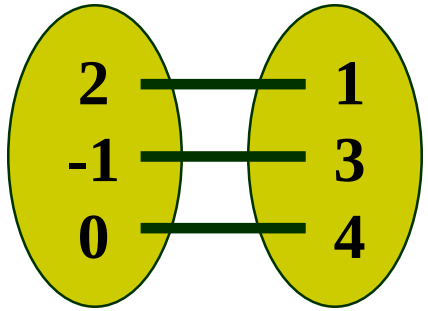
Relations can be shown in several ways:

The relation {(2,1), (-1,3), (0,4)} can be shown by

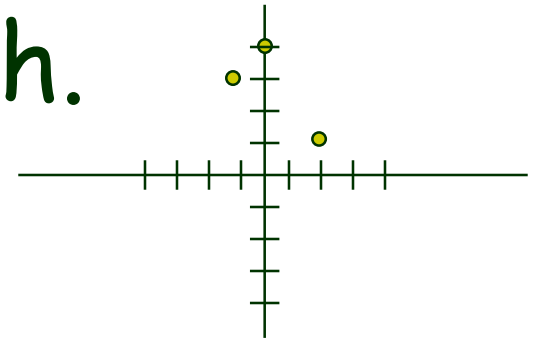
1) a table.

x	y
2	1
-1	3
0	4

2) a mapping.



3) a graph.



Given the following table, show the relation, domain, range, and mapping.

x	-1	0	4	7
y	3	6	-1	3

Homework:

Workbook p. 81 & 82

5.3B Functions

Main Idea: Complete function tables.

CCSS 8.F.1

Vocabulary:

- Function: a relation in which each member of the domain is paired with exactly one member of the range
- Input value – domain
- Output value – range

Special function notation:

$f(x) = 2x + 4$

Read 'f of x equals two x plus four'

f(x) does not mean f times x

Find a function value: plug in that value for x and simplify

Example: Find $f(-6)$ if $f(x) = 3x + 4$

Vocabulary:

- Function table – way to organize input, output, and rule
- Independent variable – variable for domain
- Dependent variable – variable for range (it depends on the domain)

Example: Choose four values for x to make a function table for f(x) = 4x – 1. Then state the domain and range of the function.

Domain	Rule	Range
x	f(x) = 4x - 1	f(x)

Homework:

p. 303 #8 - 23

5.3C Linear Functions

Main Idea: Represent linear functions using function tables and graphs. Determine whether a set of data is continuous or discrete.

CCSS 8.F.1, 8.F.3, 8.F.4

Graph a linear function:

Example: graph y = x + 3

Vocabulary:

- Continuous data – no space between data values (solid lines)

- Discrete data – spaces between data values (dots)

Example: Each student receives 2 jolly ranchers. Write a rule, make a table, and graph the function. Is the function continuous or discrete?

Homework:

p. 309 #6 - 18

5.4A Linear and Nonlinear Functions

Main Idea: Determine whether a function is linear or nonlinear.

Nonlinear function -
functions whose rate of change is not constant(graph is not a line)

Example: Determine whether each table represent a linear or nonlinear function. Explain.

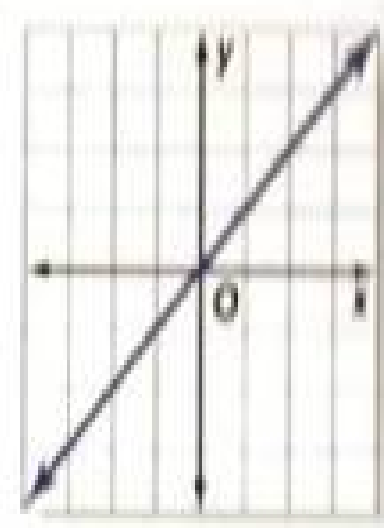
x	2	4	6	8
y	2	20	54	104

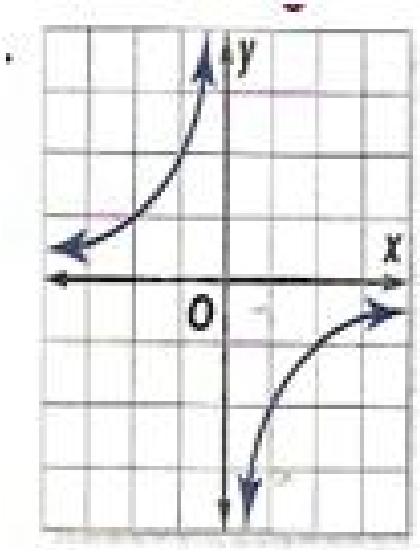
Example: Determine whether each table represent a linear or nonlinear function. Explain.

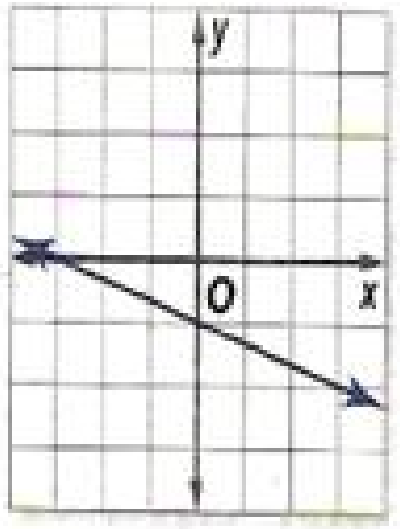
x	1	4	7	10
y	0	9	18	27

Graphs: Linear or Nonlinear

- **Is the graph a straight line?**







Exit Slip

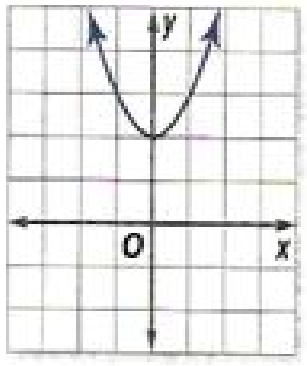
- **Identify if linear or nonlinear.**

1) Table A

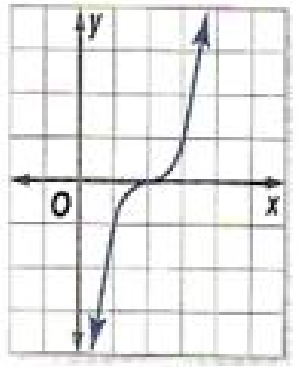
x	3	6	9	12
y	12	10	8	6

2) Graph

a



b



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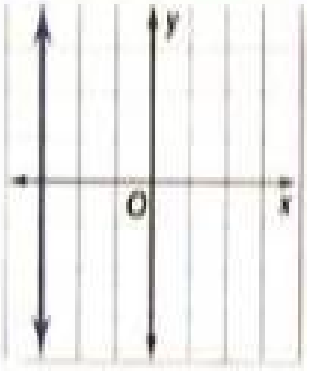

Homework:

p. 317 #7 - 21

5.4B Graph Quadratic Functions

Main Idea: Graph quadratic functions.

Quadratic function: greatest power is 2

Parent function: $y = x^2$

Graph:

Graph $y = 5x^2$

Graph $y = -x^2 - 3$

General Properties about Quadratics:

Homework:

Workbook p.95 & 96

Chapter 5 Test