

VVEEK I	
	 Domain and Range
Week 2	 Slope and y-intercepts
Week 3	 Independent and Dependent Variables Graphing Equation of a line
	 Multiple Representations

May 18th Focus: SOL 8.15 - The student will...

- **a**) determine whether a given *relation* is a *function*; and
 - **b**) determine the <u>domain</u> and <u>range</u> of a function.

Vocabulary Review:

- A *relation* is any set of ordered pairs. For each first member, there may be many second members.
- A *function* is a relation between a set of inputs (x values), called the <u>domain</u>, and a set of outputs (y values), called the <u>range</u>, with the property that each input is related to exactly one output.
 - \succ X values cannot repeat in order to represent a function
- Some relations are functions; all functions are relations.





May 19th Focus: SOL 8.15 - The student will...

- a) determine whether a given *relation* is a *function*; and
 - **b**) determine the domain and range of a function.

Vocabulary Review:

- The **domain** is the set of all the input values for the independent variable or x-values (first number in an ordered pair).
 - \succ Example: (**5**, 2)
- The **range** is the set of all the output values for the dependent variable or y-values (second number in an ordered pair.
 - \succ Example: (5, **2**)

1) Complete the function table below. Then, list all of the **domain** and **range values**. $\mathbf{v} = 2\mathbf{x}$ Domain = _____ Range = _____

Х	У
-1	
	0
2	
	10

2) Marissa used the set of ordered pairs below to graph a relation.

 $\{(3,4),(2,3),(2,0),(4,2),(3,6)\}$

What is the **domain** of the relation?

A. $\{0, 2, 3, 4, 6\}$

- **B.** $\{2,3,4\}$
- C. $\{0, 2, 3, 4\}$
- D. $\{0,3,6\}$

3) Circle the **domain** of the relation listed below: $\{(-2,-2),(-1,0),(0,2),(1,4),(2,6)\}$

4) Complete the function table below. Then, list all of the **domain** values.

v = 2v + 1

y = -2x +	1				
X	-2			1	2
У		-1	1		
Domain:					

5) The table below defines a function.				
Changes in Joshua's Height Per Year				
Year	2002	2003	2004	2005
Change in height (inches)	2.5	2.25	1.5	0.75
What is the domain of the function?				



4) Marcus used the set of ordered pairs below to graph a relation. {(3,4),(2,3),(2,0),(4,2),(3,6)}
What is the range of the relation?
A. {2, 3, 4}
B. {0, 2, 3, 4, 6}
C. {0, 2, 3, 4, 6}
D. {0, 2, 3, 4, 5, 6}

5) Alex created a table to represent the function y = 2x+4. What is the range for this table of values?

У
0
4
8
12

May 21st Focus: SOL 8.15 - The student will...

a) determine whether a given *relation* is a *function*; andb) determine the <u>domain</u> and <u>range</u> of a function.

1) Circle ALL of the following that **does** represent a function.

Β.

D.

C.

x	у	
-1	5	
2	2	
5	2	
3	-6	
2	-4	

x	У
3	-1
0	2
-1	4
2	3
1	1

 2) In the linear equation shown, which variable would represent the output (range) values? y = mx + b

A. y B. m

C. x

D. b

3) Complete the following function table then list the domain and range of the function:

 $y = \frac{1}{2}x + 2$

Input	Output
-2	
0	
2	
4	

4) Complete the following function table then list the domain and range of the function:

$$y = \frac{-5}{1} x -$$

- 4	
Χ	Y
-5	
1	
	-9.75
13	

1

Domain: _____

Domain: ______ Range: _____

Range:

5) Does the following graph represent a function? (circle one) YES or NO



May 22nd Focus:

Vocabulary Review:

- A *relation* is any set of ordered pairs. For each first member, there may be many second members.
- A *function* is a relation between a set of inputs (x values), called the <u>domain</u>, and a set of outputs (y values), called the <u>range</u>, with the property that each input is related to exactly one output.

X - values cannot repeat in order to represent a function

- Some relations are functions; all functions are relations.
- The **domain** is the set of all the input values for the independent variable or x-values (first number in an ordered pair).

➢ Example: (5, 2)

- The **range** is the set of all the output values for the dependent variable or y-values (second number in an ordered pair.
 - ➢ Example: (5, 2)

1) Identify all of the true statements.

A. All relations are functions, but not all functions are relations.

B. All functions are relations, but not all relations are functions.

C. In any set of ordered pairs, the second coordinate is called the domain.

D. A function is a relation between a set of inputs and a set of outputs with the property that each input is related to exactly one output.

2) Moana created a table to represent the function y = -2x + 3. If the domain of the function is $\{-2, 0, 2, 4\}$, which of the domain values results in the greatest range value?

A2	B. 0	C. 2	D. 4

3) Which function , when inputting -3,		4) Which function would yield an output of		
would result in an out	put of 10?	15 when you input	15 when you input 2?	
A. $y = 3x + 1$	B. $y = 3x - 1$	A. $y = \frac{-3}{4}x + 12$	B. $y = \frac{3}{4}x - 12$	
C. $y = -3x + 1$	D. y = -3x - 1	$-\frac{2}{-3}$ 12	2	
		C. $y = \frac{1}{2}x - 12$	D. $y = \frac{1}{2}x + 12$	
5) Which domain value results in the smallest range value from			he following domains if	
given the function y =	= -5x + 3?			
$\{-1, 0, 1, 2\}$				
A1	B. 0	C. 1	D. 2	

Slope

Focus: 8.16a The student will recognize and describe the graph of a linear function with a slope that is positive, negative, or zero;

Vocabulary Words: Slope, Positive Slope, Negative Slope, Zero Slope and No Slope

Notes:

Slope: Slope (m) represents the rate of change in a linear function or the

"steepness" of the line. The slope of a line is a rate of change, a ratio describing

the vertical change to the horizontal change.







Identifying Slope Types





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8.16b

1. The table of values below represents a linear relationship.

x	У
-4	6
0	3
4	0

What is the slope and y-intercept for this line?

slope _____

	y-intercept		
-		 	

2. The equation y = -4x - 10 represents a linear relationship. What is the slope and *y*-intercept for this line?

slope _____ y-intercept _____

3. Choose two true statements about the slope and y-intercept of the linear function shown.



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- 4. Which is an equation for a line with a slope of -4 and a y-intercept of 5?
 - A. y = 5x 4B. y = -4x + 5C. $y = -\frac{4}{5}x$ D. $y = -\frac{5}{4}x$
- 5. Which table of values represents a line with a slope of -1 and a y-intercept of 4?

Α.		
	x	У
	-1	-5
	0	-1
	1	-3

В.

x	У
-4	8
0	4
4	0

C.

x	У
-1	0
0	-4
1	-8

D.

x	У
-4	0
0	4
4	8

SLOPE-INTERCEPT FORM y = m x + b

m is the

b is the _____

Write the equation of a line given the slope and y-intercept.

Write the equation of the line with the given slope and y-intercept.

2) Slope is $\frac{3}{4}$ and y-intercept is -31) Slope is -2 and a y-intercept of 5

Write the equation of a line in slope i	ntercept form given a graph .
3) y y x x $(3, -1)$ $(0, -5)$ $(0, -5)$	4) $2 \frac{y}{(0, 1)}$ $(4, -1)$
Slope:	Slope:
Y-Intercept:	Y-Intercept:
Equation:	Equation:
Examples: Write the linear equation for the gr 5)	aph shown. 6)
Slope:	Slope:
Y-Intercept:	Y-Intercept:
Equation:	Equation:

Write the equation of a line in slope intercept form given a table.



Examples: Graph the equations in Slope-Intercept Form....

GRAPH THE Y-INTERCEPT FIRSTI

$$y=2x+1$$

Slope: Y-Int:





Slope: Y-Int:

_								
		_				_		

Week 3

Independent and Dependent Variables (SOL 8.16c)

Determine the independent and dependent variable, given a practical situation modeled by a linear function. Vocabulary -- dependent variable, domain, function, independent variable, range

<u>Students will</u> complete the Poster and Identify the independent and dependent variables Worksheet for each situation presented on the chart.

NOTES:

Independent Variable: Cause or Input. The Variable that we choose or can control.

<u>Dependent Variable</u>: Effect or Output. The Variable that Changes as a result of the Independent Variable Changing.

Poster Directions

Make a poster that uses pictures to show the difference between a dependent variable and an independent variable. Find or devise an example of a dependent variable and an example of an independent variable, using the list below as a start. Th poster can be done on a sheet of notebook paper. Your poster must the following:

- A title
- Two pictures, one illustrating each variable (Pictures may be either drawn, cut out from newspapers or magazines, or printed.)
- Labels for "Dependent Variable" and "Independent Variable"
- A caption that says, "______ depends on ______."

DEPENDENT	INDEPENDENT
Cell phone bill	Minutes used
How far you can drive	The amount of gas you have
Your mathematics grade	The number of assignments you turned in
How much money you earn	The hours you work
Cost of a speeding ticket	How many miles you went over the speed limit
Time it takes to drive somewhere	How fast you drive
Result of a football game	Who scores more points
How much air conditioning you use	Temperature
Total calories and fat	Number of cookies
Opportunities for high-paying jobs	How much education you have

Independent and Dependent Variables

Name	
------	--

_____ Date _____

Identify the independent and dependent variables for each situation described below.

	Independent Variable	Dependent Variable
John measures the length of each side of a square. He uses that value to calculate the perimeter.		
<i>y</i> = 4 <i>x</i> + 1		
David measures how many inches his tomato plant grows every week.		
Mark works full time as a busboy at a local café. He earns \$6 per hour.		
The number of gum balls, g , that can be packaged in a box with a volume of V cubic units is given by $g = 40V +$ 15.		
Jake works as a sales representative. He earns \$1,275 per month plus an 8 percent commission on his total sales.		

Graphing Linear Functions (8.16d)

Students will graph a linear function given the equation in y = mx + b form

• Vocabulary: axis, coordinate plane, ordered pairs, quadrants, slope, y-intercept, horizontal line, linear function, negative slope, positive slope, undefined slope, vertical line, zero slope

NOTES:				
Steps	Example			
 Step 1: Make a t-chart Step 2: Pick in 3-5 values for x. *Use (-2, 0, 2) to start unless it is a real life problem. Step 3: Substitute each value for x and solve for y. Step 4: Record ordered pairs in table. Step 5: Graph the points and draw the line. 	2x - 2y = 6 $2(-2) - 2y = 6$ $-4 - 2y = 6$ $+4 + 4$ $-2y = 10$ $-2 - 2$ $y = -5$ $2(0) - 2y = 6$ $-2y = 6$ $-2 - 2$ $y = -3$ $2(2) - 2y = 6$ $4 - 2y = 6$ $-4 - 4$ $-2y = 6$ $-4 - 4$ $-2y = 2$ $-2 - 2$ $y = -1$	-5 -4 -3 -2	X -2 0 2 y 5 4 3 2 1 -1 -1 -1 -1 -2 -3 -4 -5	Y -5 -3 -1

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8.16d



2. Plot three points that lie on the line y = -3x + 2.



3. What is the equation for the line graphed below?



4. Which graph corresponds to y = -2x - 1?

Graph A



Graph B



Graph C



Graph D



5. Which linear equation best represents the graph below?



6. Which linear equation represents the same relationship shown in the graph below?



Complete the activity sheet by creating tables for the equations and graphing the lines on the graph paper.

Stained Glass Graph

- 1. Using regular graph paper, create a table for each equation, and then graph each of the lines.
- 2. Draw the lines to the edges of your graph paper.
- 3. Use a black marker to make each line bold.
- 4. Color each section a different color.

1.
$$y = -\frac{1}{2}x - 4$$
 7. $y = -\frac{1}{2}x + 4$

- 2. y = -x + 12 8. y = x + 12
- 3. y = 12 9. y = -12
- 4. *y*-axis 10. y = -x 12

5.
$$y = \frac{1}{2}x + 4$$
 11. $y = x - 12$

$$6. \quad y = \frac{1}{2}x - 4$$

T

The student will make connections between and among representations of a linear function using verbal descriptions, tables, equations, and graphs.

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8.16e

1. Josie is saving money to purchase a new pair of shoes. She has already saved \$5 and will earn \$0.50 for each chore she completes. Graph the relationship between number of chores Josie completes and the total amount she will have saved.



What part of Josie's scenario represents the slope of the line you graphed? What part of Josie's scenario represents the *y*-intercept of the line you graphed?

- 2. A linear function has a slope of 4 and a y-intercept of 3.
 - A. Write an equation to represent this function
 - B. Create a scenario to represent this function.
 - C. Make a table of values with at least 3 ordered pairs that represents this function.
 - D. Graph this function on a coordinate plane.



3. Which graph represents the same linear relationship shown in the table below?

x	y
-1	-5
1	-1
2	1
4	5







Graph C



Graph D



4. Which equation represents the same linear function in the table below?

C.

D.

		A. $y = -x + 7$
<u>x</u>	<u>y</u> 7	B. $y = 4x + 3$
3	15	C. $v = 8x + 7$
5	23	D. $y = x + 8$

5. Which table of values is represented by y = 3x - 2?



x	у
4	10
6	7
8	4

x	<i>y</i>
1	1
2	4
3	7

B.

x	У
4	10
6	12
8	14

6. The graph represents the same relationship as which table of ordered pairs?



A. х y 8 14 16 9 10 18

C.		
	x	у
	-10	18
	-9	16
	-8	14

B.

x	<i>y</i>
8	-18
9	-20
10	-22

ډ ا	;	y
-1	0	22
-9	9	20
-	8	18

D.

Students: Cut the sections from page 27 apart and shuffle each set of cards. Match the Cards by Equation, Verbal Representation, table and Graph and Glue/tape onto this sheet.

Equation	Verbal Description	Table	Graph

Equation	Verbal Description	Table	Graph
y = 2x + 1	Six more than a number is equal to <i>y</i> .	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	y
y = -2x - 1	y equals twice a number, increased by one.	x y 2 3 3 3 4 3	y 6 6 7 6 7 6 7 7 7 7 7 7 7 7 7 7 7 7 7
y = 3	y is three.	$ \begin{array}{c ccc} x & y \\ -2 & -8 \\ 0 & 0 \\ 1 & 4 \end{array} $	y
y = 4x	The product of negative two and a number, minus one, is another number.	x y -3 -5 0 1 3 7	y
<i>y</i> = <i>x</i> + 6	Four times a number is <i>y</i> .	x y -2 3 -1 1 0 -1	y