Name: __Key__
Date: _____ Block: _____

Linear Functions Unit Review

What you need to know & be able to do	Things to remember	Examples	
1. Determine if a relation is a function. Day 1	Every input only has one output (each 'x' only has one 'y') Use the vertical line test on graphs.	1. Determine if the graph is a function. **Function**	2. Determine if the table represents a function. | x	y
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(-1)	4
0	5
2	6
(-1)	7	 **not a Function**
2. Create an input-output table for a function. Day 1	"x-y chart" – choose the x-values & plug them in	3. Create an input-output table for the function $f(x) = 2x - 3$. Use x = -2, -1, 0, 1, and 2. | x	fx
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-2	-7
-1	-5
0	-3
1	-1
2	1		4. Create an input-output table for the function $f(x) = 6$. Use x = -2, -1, 0, 1, and 2. | x	fx
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-2	6
-1	6
0	6
1	6
2	6	
3. Evaluate functions. Day 1	f(x) function notation f(2) means you must substitute a '2' for every 'x' in the function!	5. Evaluate f(4). $$f(x) = x^2 + 3x - 1$$ $$f(4) = (4)^2 + 3(4) - 1$$ $$f(4) = 16 + 12 - 1$$ $$\boxed{f(4) = 27}$$	6. Find the value of $f(x) = 4x - 2$ when $x = -1$. $$f(-1) = 4(-1) - 2$$ $$f(-1) = -4 - 2$$ $$\boxed{f(-1) = -6}$$
		7. a. Find f(5). $f(5) = 5$ b. Find the value of x for f(x) = 2. $$f(4) = 2$$ c. What is the maximum and minimum? Write in function notation. max: $f(3) = 7$ min: $f(-7) = -7$	(graph)

4. Write a function. Day 2		8.		9.	

4. Write a function.

Day 2

8.

Time Worked (h)	1	2	3	4
Amount Earned f(h)	5	10	15	20

$$f(h) = 5h$$

$1 \times 5 = 5$

$2 \times 5 = 10$

9.

x	1	2	3	4
y	-2	-1	0	1

$$y = x - 3$$

$1 - 3 = -2$

$2 - 3 = -1$

$3 - 3 = 0$

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5. Create a function & use it to solve a problem.

Day 2

10. You join a kickboxing class at a local gym. The cost is $5 per class plus $30 for the initial membership fee. Write a rule for the total cost of the class as a function of x. How much will it cost if you attend 7 classes?

$$y = 5x + 30$$
$$y = 5(7) + 30$$
$$y = 65$$

11. Air Force One can travel 630 miles per hour. Let h be the number of hours traveled. Write a function rule that represents the total number of miles traveled. Then, determine how many miles Air Force One can travel in 4 hours.

$$m = 630h$$
$$m = 630(4)$$
$$m = 2520 \text{ miles}$$

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6. Calculate the average rate of change (slope).

Day 3 & 9

"slope"

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\frac{\text{Change in } y}{\text{Change in } x}$$

12. Calculate the slope. Then write the equation of the line.
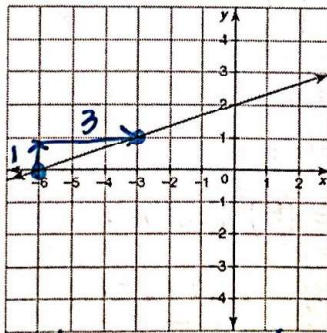
$m = 1/3$ y-int $(0, 2)$

$$y = 1/3x + 2$$

13. Calculate the average rate of change between the following points on a line.

$(0, 4)$ & $(-3, 10)$

$$\frac{10 - 4}{-3 - 0} = \frac{6}{-3} = -2$$

14. Calculate the slope. Give a labeled answer.

Number of Balloons	Total Cost of Balloons (in Dollars)
2	6
4	12
6	18
8	24

$$\frac{12 - 6}{4 - 2} = \frac{6}{2} = \frac{\$3}{1 \text{ balloon}}$$

15. Calculate the slope. Give a labeled answer.

$\frac{-300}{3} = \frac{-100}{1 \text{ week}}$

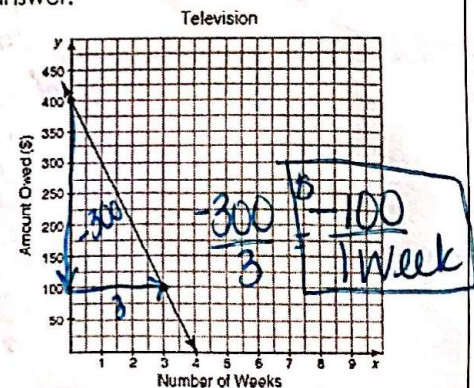| | culate y-intercept | Point where graph crosses y-axis | 16. Name the y-intercept: | 17. A photography studio charges $50 that includes a sitting fee and 6 prints. Luigi increased his order to 11 prints and paid $65. How much was the sitting fee? |

| calculate y-intercept Days 3, 4, & 9 | Point where graph crosses y-axis (0, b) | **16. Name the y-intercept:** |

x	0	1	3	4
y	8	6	2	0

$(0,8)$

17. A photography studio charges $50 that includes a sitting fee and 6 prints. Luigi increased his order to 11 prints and paid $65. How much was the sitting fee?

$$\frac{65-50}{11-6} = \frac{15}{5} = \frac{\$3}{1\ picture}$$

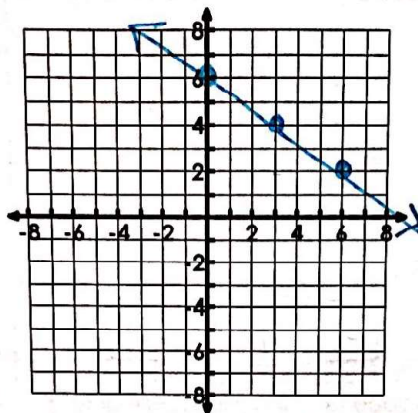| 0 | 32 |
1	35
2	38
3	41
4	44
5	47
6	50

$32 sitting fee

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8. Graph a linear function
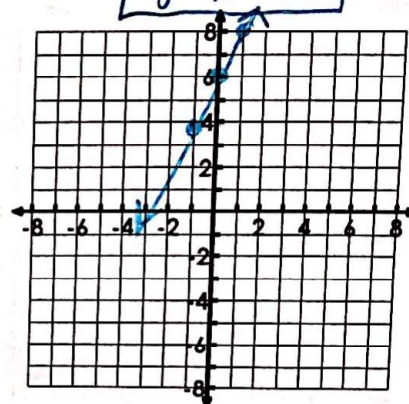
Day 5 & 6

$y = mx + b$

*Always graph the y-intercept first and then use slope to determine next point.

18. Graph: $f(x) = -\frac{2}{3}x + 6$

19. Graph: $-4x + 2y = 12$

$$+4x \qquad +4x$$
$$\frac{2y}{2} = \frac{4x}{2} + \frac{12}{2}$$
$$\boxed{y = 2x + 6}$$

20. Graph x = -3. Name slope & y-intercept

m = undefined   y-int: none
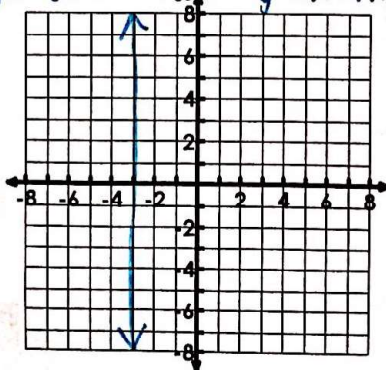
21. Graph y = 4. Name slope & y-intercept.

m = 0   y-int: (0,4)

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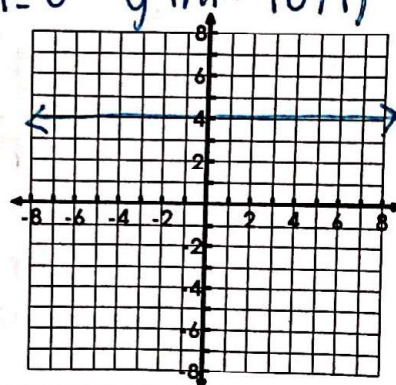
9. Convert from standard to slope intercept form

Day 6

Slope Intercept: y = mx + b

Standard: Ax + By = C

22. Solve for y: 4x + 2y = 8

$$-4x \qquad -4x$$
$$\frac{2y}{2} = \frac{-4x}{2} + \frac{8}{2}$$
$$\boxed{y = -2x + 4}$$

23. Determine the slope and y-intercept:
3x - 6y = -12.

$$-3x \qquad -3x$$
$$\frac{-6y}{-6} = \frac{-3x-12}{-6} \frac{}{-6}$$
$$y = \frac{1}{2}x + 2$$

m = 1/2

y-int: (0,2)

| 10. Convert from slope intercept to standard form

Day 6 | Slope Intercept:
$y = mx + b$

Standard: $Ax + By = C$
(no negative A values; multiply by -1 if necessary) | 24. Put in standard form:
$$y = 3x + 4$$
$$\underline{-3x \quad -3x}$$
$$-1(-3x + y) = 4(-1)$$
$$\boxed{3x - y = -4}$$ | 25. Put in standard form:
$$y = -2/3x - 5$$
$$(3)y = \left(\frac{-2}{3}x - 5\right)3$$
$$3y = \frac{-6}{3}x - 15$$
$$\underline{3y = -2x - 15} \quad \boxed{2x + 3y =}$$
$$+2x \quad +2x$$ |

| 11. Write the equation of a line.

Day 5, 10, 11 | $y = mx + b$ | 26. Write the equation of the line that has a slope of $-\frac{1}{2}$ and contains the point (4, 6).
$$y = mx + b$$
$$6 = -\frac{1}{2}(4) + b$$
$$6 = -2 + b$$
$$\underline{+2 \quad +2}$$
$$8 = b$$
$$\boxed{y = -1/2x + 8}$$ | 27. Write the equation of the line that contains the points (-2, 2) and (2, -6).
$$\frac{-6-2}{2--2} = \frac{-8}{4} = -2$$
$$y = mx + b$$
$$2 = -2(-2) + b$$
$$2 = 4 + b$$
$$\underline{-4 \quad -4}$$
$$-2 = b \quad \boxed{y = -2x - 2}$$ |

10. Convert from slope intercept to standard form — Day 6

Slope Intercept: $y = mx + b$

Standard: $Ax + By = C$ (no negative A values; multiply by -1 if necessary)

24. Put in standard form:
$$y = 3x + 4$$
$$\underline{-3x \quad -3x}$$
$$-1(-3x + y) = 4(-1)$$
$$\boxed{3x - y = -4}$$

25. Put in standard form:
$$y = -2/3x - 5$$
$$(3)y = \left(\frac{-2}{3}x - 5\right)3$$
$$3y = \frac{-6}{3}x - 15$$
$$3y = -2x - 15 \qquad \boxed{2x + 3y =}$$
$$\underline{+2x \qquad +2x}$$

11. Write the equation of a line. — Day 5, 10, 11

$y = mx + b$

26. Write the equation of the line that has a slope of $-\frac{1}{2}$ and contains the point (4, 6).
$$y = mx + b$$
$$6 = -\frac{1}{2}(4) + b$$
$$6 = -2 + b$$
$$\underline{+2 \quad +2}$$
$$8 = b$$
$$\boxed{y = -1/2x + 8}$$

27. Write the equation of the line that contains the points (-2, 2) and (2, -6).
$$\frac{-6-2}{2--2} = \frac{-8}{4} = -2$$
$$y = mx + b$$
$$2 = -2(-2) + b$$
$$2 = 4 + b$$
$$\underline{-4 \quad -4}$$
$$-2 = b \qquad \boxed{y = -2x - 2}$$

28. Write the equation of the line that has a slope of 5 and y-intercept at (0, 3).
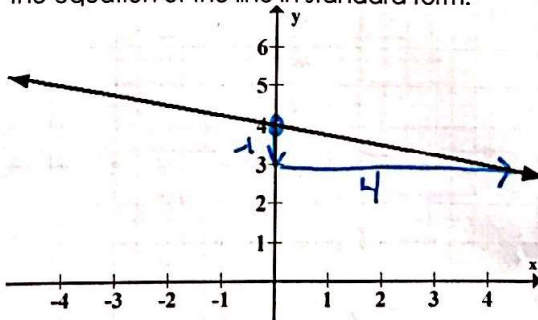$$\overset{m}{} \qquad \overset{b}{}$$
$$y = mx + b$$
$$\boxed{y = 5x + 3}$$

29. Write the equation of the line the corresponds to the following table:

x	2	5	8	11
y	-6	-4	-2	0

30. Write the equation of the line that corresponds to the graph below. Then write the equation of the line in standard form.

Slope-Intercept
$$\boxed{y = -\frac{1}{4}x + 4}$$

Standard
$$(4)y = \left(-\frac{1}{4}x + 4\right)4$$
$$4y = -\frac{4}{4}x + 16$$
$$4y = -x + 16$$
$$\underline{+x \qquad +x}$$
$$\boxed{x + 4y = 16}$$