Algebra 1/2

Semester 1

Final Retention Exam Review

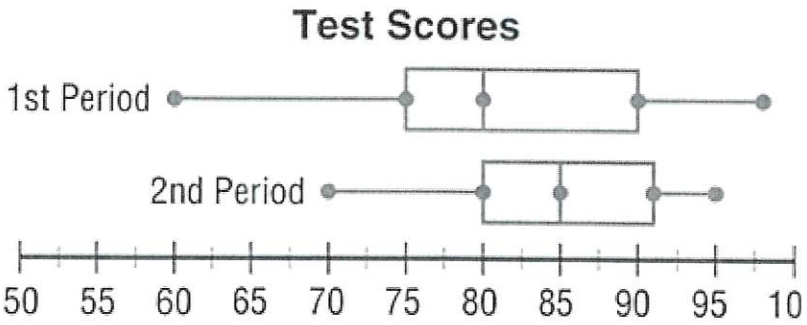
Name _____

Period _____ Date _____

Units of Study:		Booklet/Worksheets:	Quizzes & Tests:
Unit 1	1-Variable Statistics		Quiz 1 & Test 1
Unit 2	Solving Equations		Quiz 2 & Test 2
Unit 3	Slope-Intercept Form		Quiz 3 & Test 3
Unit 4	Standard Form & Point-Slope Form		Quiz 4 & Test 4
Unit 5	Two-Variable Statistics & Line of Best Fit		Work Sample

UNIT 1 Learning Targets: 1-Variable Statistics • I can interpret dot plots, box plots and histograms. • I can identify and contextualize appropriate measures of center and spread for a given set or shape of data (comparing 2 or more data sets)	**Working Towards (2)**	**Close to Proficient (3)**	**Close to Proficient (4)**	**Proficient (5)**

For problems 1-3, use the parallel box plots at right →



1. Which class period had a **lower** median? Explain.

1st period has a median of 80, lower than 2nd period's median of 85

2. Which class period was **more consistent** with their scoring? Explain.

2nd period is more consistent b/c the box is skinnier.

3. Which class period typically scored **higher**? Explain.

2nd period because its min, Q_1, Med, & Q_3 are higher than 1st

4. Calculate mean, median, mode, range, IQR, and standard deviation for the following data:

5, 7, 9, 4, 5, 7, 6, 4, 9, 12, 3, 1, 5, 5, 5 → In order 1, 3, 4, 4, 5, 5, 5, 5, 6, 7, 7, 9, 9, 12

Can also type into calc & use 1-Var stats

Mean = 5.8

St. Dev = 2.7

Mode = 5

Med = 5

Range = 12 − 1 = 11

IQR = 7 − 4 = 3

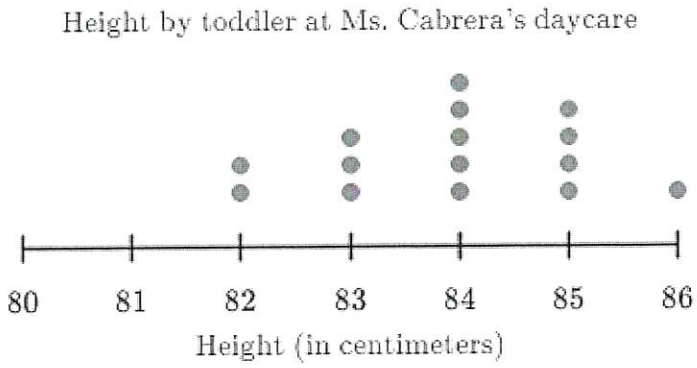
For **problems 4-5**, use the dot plot at right:

5. Describe the shape of the dot plot.

Slightly left skewed

6. How could you increase the standard deviation by moving one point? Explain.

Move a dot from the middle to the edge to increase variability, e.g. 84 to 80.



STOP and check your answers for Unit 1. Give yourself a score, and then fix any errors.

UNIT 2 Learning Targets: Solving Equations • I can solve 1-variable linear equations • I can rewrite expressions using algebraic properties	**Working Towards (2)**	**Close to Proficient (3)**	**Close to Proficient (4)**	**Proficient (5)**

For problems 6-10, solve for the variable. Check your solution.

7. $2x + 3 = 67$

$-3 \quad -3$

$2x = 64$

$x = 32$

8. $\frac{x}{2} - 5 = -3$

$+5 \quad +5$

$\frac{x}{2} = 2$

$x = 4$

9. $4x - 7 = -2x - 1$

$+2x \quad +2x$

$6x - 7 = -1$

$+7 \quad +7$

$\frac{6x}{6} = \frac{6}{6}$

$x = 1$

10. $\frac{x}{8} = \frac{9}{12} \cdot 8$

$x = \frac{72}{12}$

$x = 6$

11. $4(2x + 3) = 8x - 5$

$8x + 12 = 8x - 5$

$-8x \quad -8x$

$12 = -5$

No solution

12. $4(x + 6) + 2x = 24$

$4x + 24 + 2x = 24$

$6x + 24 = 24$

$6x = 0$

$x = 0$

13. $\frac{x+5}{3} = \frac{x}{4}$

$4(x+5) = 3x$

$4x + 20 = 3x$

$-4x \quad -4x$

$20 = -1x$

$-20 = x$

14. $3(x - 4) = 12$

$3x - 12 = 12$

$+12 \quad +12$

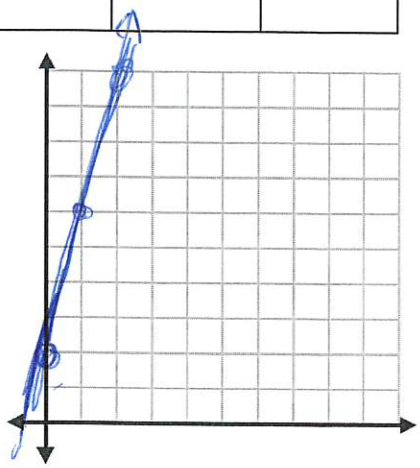
$3x = 24$

$x = 8$

STOP and check your answers for Unit 2. Give yourself a score, and then fix any errors.

UNIT 3 Learning Targets: Slope-Intercept Form • I can write or represent a linear function using a table, graph, or other situation • I can solve and evaluate linear functions • I can identify which situations can be modeled with a linear relationship in slope-intercept form	Working Towards (2)	Close to Proficient (3)	Close to Proficient (4)	Proficient (5)

15. Bob the puppy was born and weighed 2 pounds. Each month he gains 4 pounds. **Write an equation in <u>slope-intercept form</u> (y=mx+b) to represent the situation, and then graph it.**



Equation: $y = 4x + 2$

a. Use your equation to calculate how much he will weigh in 15 months.

$y = 4(15) + 2 = 62$ lbs

b. Use your equation to calculate how many months it will take for him to weigh 150 pounds.

$150 = 4x + 2$

$-2 \quad -2$

$148 = 4x$ → $x = 37$ months

16. Calculate the slope...

a. ...of the line between the points (3,4) and (8, 8)

Slope: $\frac{8-4}{8-3} = \frac{4}{5}$

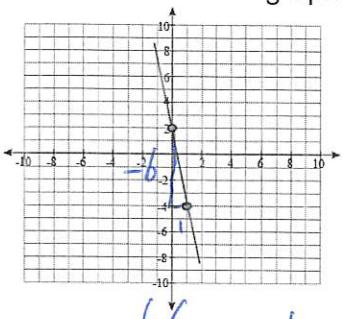
b. ...of the line in this table:

x	y
5	8
6	8
7	8
8	8

+1 (6, 8) +0

Slope: $\frac{0}{1} = 0$

c. ...of the line on this graph:



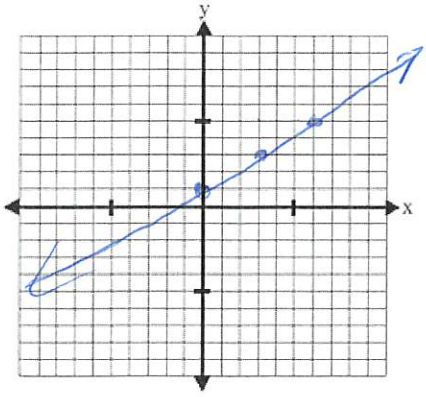
Slope: $\frac{-6}{1} = -6$

17. Identify the slope and y-intercept and then graph the line.

a. $y = \frac{2}{3}x + 1$

slope (m) = $\frac{2}{3}$

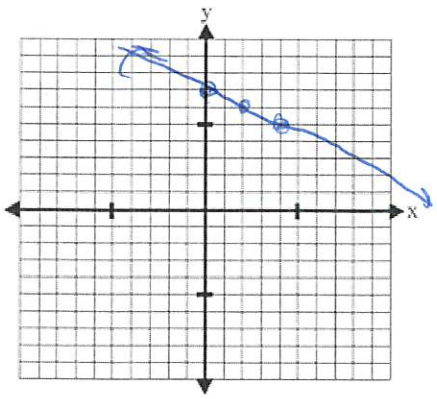
y-int (b) = 1



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

slope (m) = $-\frac{1}{2}$

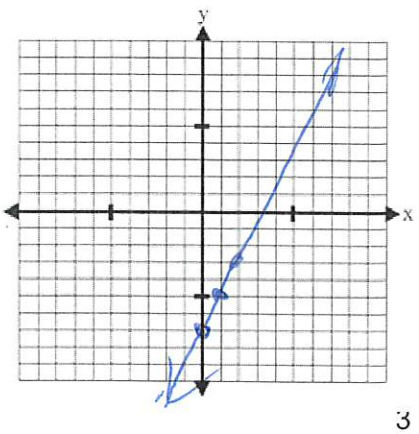
y-int (b) = 7



c. $y = 2x - 7$

slope (m) = 2

y-int (b) = −7



STOP and check your answers for Unit 3. Give yourself a score, and then fix any errors.

UNIT 4 Learning Targets: Standard & Point-Slope Form	Working Towards (2)	Close to Proficient (3)	Close to Proficient (4)	Proficient (5)
• I can model a linear relationship with standard OR point-slope form equations. • I can change a linear equation from standard and/or point-slope form to slope-intercept form. • I can link the form of a linear equation to particular contexts. • I can represent a linear equation using function notation.				

18. Decide which equation should be written in point-slope form, and which equation should be written in standard form, and explain how you know. Then, write the equation.

a. Sharona buys three oranges and 2 apples for total of $4.

Form: Standard Form

Explanation: 2 things combine to make a total

Equation: $3x+2y=4$

b. Sharona is trying to gain 3 lbs per month month. After 4 months she weighs 135 lbs.

Form: Point-slope

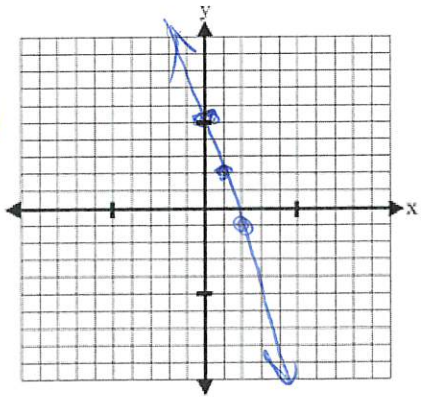
Explanation: Have a change and a point

Equation: $y=3(x-4)+135$

19. The following equations are written in standard form. Change them to slope-intercept form (by solving for y) to graph them.

a. 3x + y = 5

$y=-3x+5$

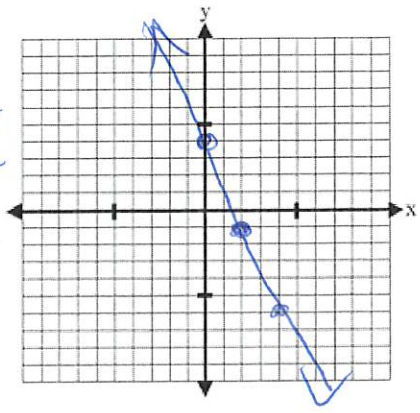


b. 5x + 2y = 8

$-5x \quad -5x$

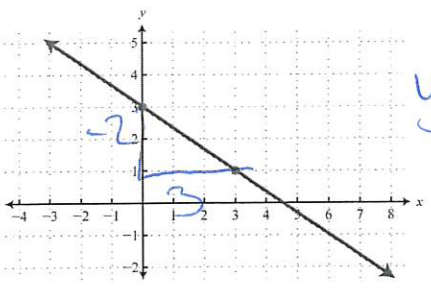
$\frac{2y}{2}=\frac{-5x+8}{2}$

$y=-\frac{5}{2}x+4$



20. Write an equation in point-slope form:

a.



$y=-\frac{2}{3}(x-3)+1$

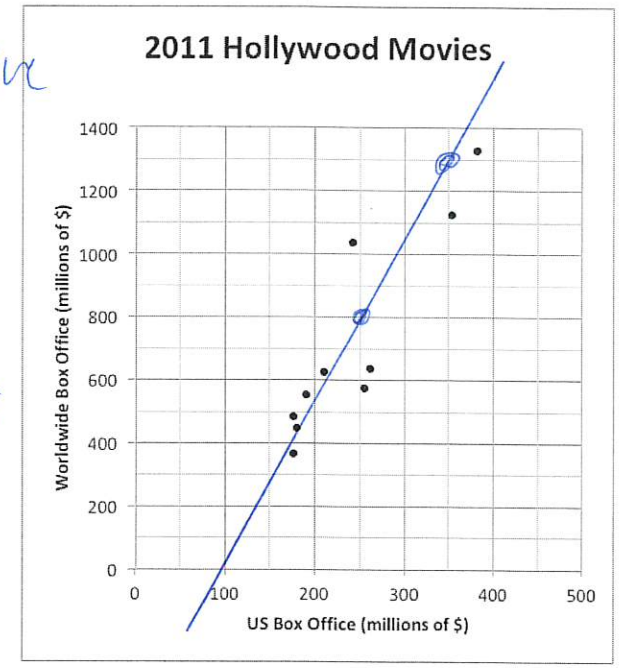
b. ...of a line with a slope of -4 and through the point (5,-7).

$y=-4(x-5)-7$

STOP and check your answers for Unit 4. Give yourself a score, and then fix any errors.

Unit 5 Learning Targets: 2-Variable Statistics & Line of Best Fit • I can define and represent two quantitative variables on a scatter plot and describe how the variables are related. • I can sketch and write an equation of best fit	Working Towards (2)	Close to Proficient (3)	Close to Proficient (4)	Proficient (5)

For **problems 21 - 25**, use the following graph:



21. Describe the correlation of the data. Strong positive

22. Draw a line of best fit on the graph.

23. Write an equation of the line of best fit.

(250, 800) & (350, 1300)

$m = \frac{1300-800}{350-250} = \frac{500}{100} = 5$

$y = 5(x-150)+800$

24. Using your equation, if the US Box Office makes $300 million in sales, find how much the Worldwide Box Office makes.

$y = 5(300-150)+800$

$y = 5(150)+800$

$y = 1550$

25. Using your equation, if the Worldwide Box Office makes $1,300 million, find how much the US Box Office makes.

$1300 = 5(x-150)+800$

$-800 \quad -800$

$\frac{500}{5} = \frac{5(x-150)}{5}$

$100 = x-150$

$+150 \quad +150$

$250 = x$

STOP and check your answers for Unit 5. Give yourself a score, and then fix any errors.

Extra Practice:

Use this data set of amount of YouTube views of 10 randomly selected videos from Portugal the Man (in millions): 3, 3, 4, 4, 5, 7, 9, 11, 14, 17

Measures of Center		
Find the mean. Calculated mean: 7.7	Find the median. Calculated median: 6	Find the Mode: Calculated mode: 3 & 4
Find the range: 17 − 3 Calculated range: 14	Find the IQR 11 − 4 Calculated IQR: 7	Find the standard deviation Calculated standard deviation: 4.9

Choose at least 6 problems from below. Solve each equation, then check your solution.

1) $4 - 3(5n - 6) = 97$ $-15n + 18 = 93$, $-15n = 75 \rightarrow n = -5$

2) $1 + 3v + 5v = 17$ $8v = 16$, $v = 2$

3) $7(7 - 4n) = 22 - n$ $49 - 28n = 22 - n$, $27 = 27n \rightarrow n = 1$

4) $5(7n + 4) = 5(8 + 7n)$ $35n + 20 = 40 + 35n$, No Sol.

5) $2(r - 5) = 2r - 2(1 - 4r)$ $2r - 10 = 2r - 2 + 8r$, $-8 = 8r$, $-1 = r$

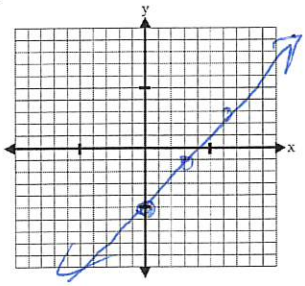
6) $8 + \frac{x}{4} = 6$ $\frac{x}{4} = -2$, $x = -8$

7) $\frac{r}{3} + 1 = -5$ $\frac{r}{3} = -6$, $r = -18$

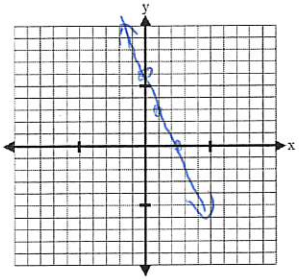
8) $\frac{6 + n}{9} = -1$ $6 + n = -9$, $n = -15$

5. Graph the equations:

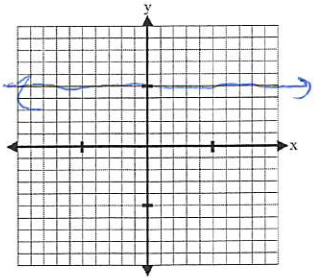
a. $y = \frac{4}{3}x - 5$



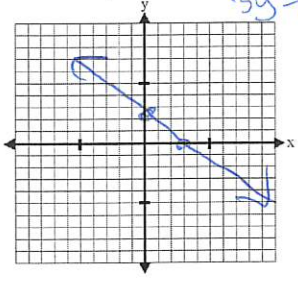
b. $y = -3x + 6$



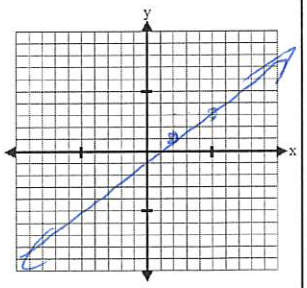
c. $y = 5$



d. $2x + 3y = 6$ $2x = 6 \rightarrow x = 3$, $3y = 6 \rightarrow y = 2$



e. $y = \frac{2}{3}(x - 2) + 1$



f. $x = -8$