Name: Date:

Unit 3 Pratice Test – Equations of Lines

Instructions:
1. Write all answers on test paper in pencil
2. Show all of your work!

Part A: Knowledge and Understanding

Quick Answers (1 mark each)

$y = mx + b$

1. The slope and *y*-intercept for $y = -2x + 7$ is:

   Slope: -2

   y-intercept: $+7$

2. The slope and the *y*-intercept for $y = 0.3x - 0.55$ are:

   m

   Slope: 0.3

   y-intercept: -0.55

3. The equation for the line with slope of 3 and *y*-intercept -1 is:

   m

   Equation : $y = mx + b$

   $x = 3x - 1$

4. The rate of change for $y = 5 - 2x$ is

   Rate of change: $y = mx + b$

   -2

5. The equation of the line through B(0, 2) and slope of -6 is
   - **A** $y = -6x + 2$
   - **B** $y = 2x + 6$
   - **C** $y = 6x + 2$
   - **D** $y = -6x$

   0

   2

   m
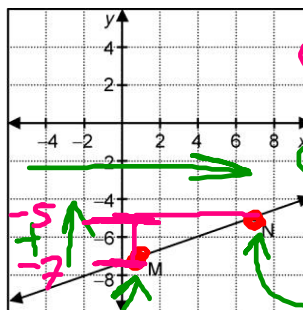
   y -2
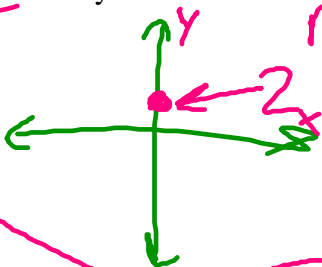
   $y = mx + b$

   $2 = (-6)(0) + b$

   $2 = 0 + b$

   $b = 2$

7. Identify the statement true for this graph:

   - **A** The rise is +2 units.
   - **B** The run is +2 units.
   - **C** The rise is -4 units.
   - **D** The x-intercept is -7

   -5
   $+3$
   -2
   ①   ②

8. A banquet hall flat fee of $500 per night plus $50 per guest. The independent variable in this situation is:

   Independent Variable: # of guests

   x

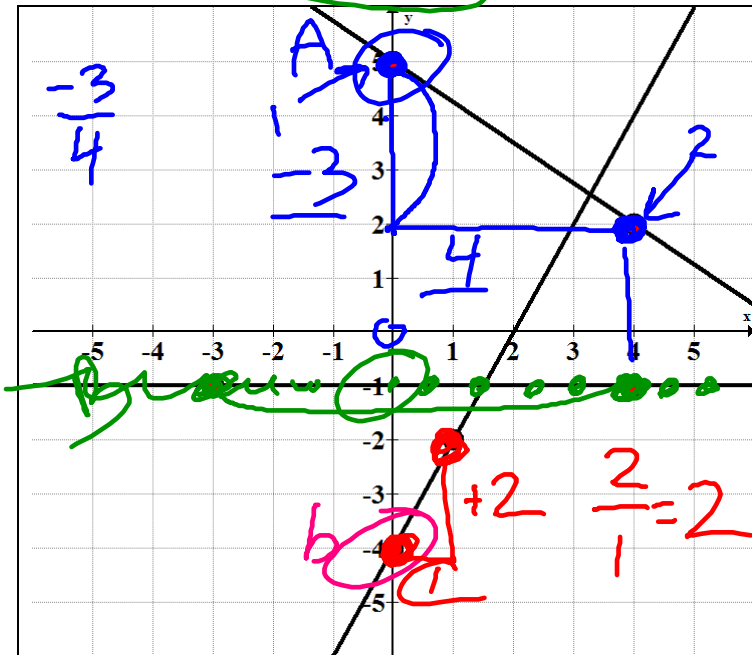**9.** The dependent variable in the situation above is:

   Dependent Variable: Total Cost ($)

   $C = 50g + 500$

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Name: $y = mx + b$ Date:

10. Determine the equation of each line on the grid shown below. (3 marks)

$\frac{-3}{4}$

Equation of Line A: _____ $y = mx + b$

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

Equation of Line B:

$\frac{0}{7} = 0$ $\frac{0}{m}$

$y = mx + b$
$y = 0x - 1$
$\boxed{y = -1}$

Equation of Line C:

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

$y = mx + b$
$y = 2x - 4$

11. Graph the equations given below on the axes provided. (6 marks)

Equation A: $y = \frac{1}{4}x - 1$

m b

Equation B: $y = -2x + 5$

m $\frac{-2}{1}$ b

Equation C: $y = -4$

m b
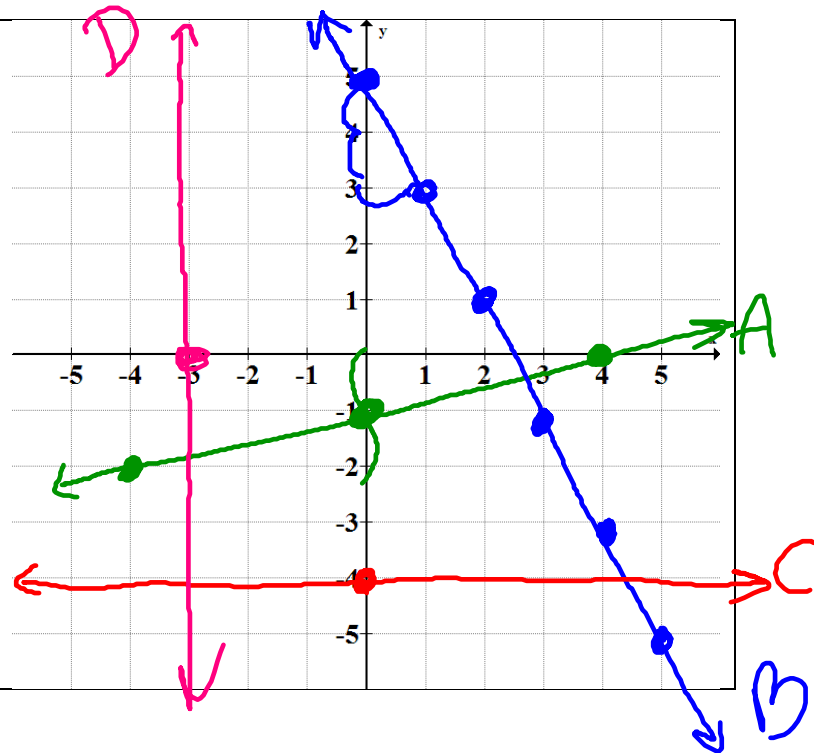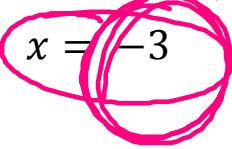
Equation D: $x = -3$

Name: Date:
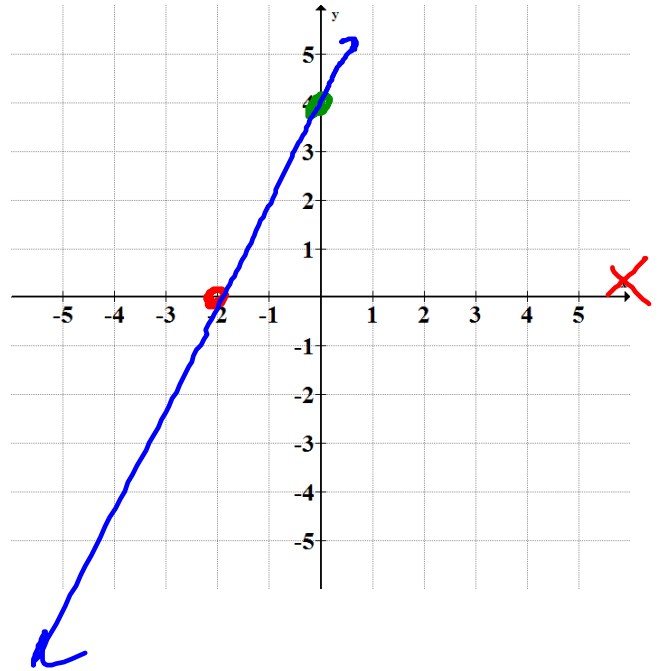
Part B: Application

1. Determine the x-intercept and y-intercept of the standard form equation given below, then graph the line on the grid provided. (6 marks)

$$-4x + 2y - 8 = 0$$

$$-4x + 2y - 8 = 0$$

x-int	y-int
$-4x + 2y - 8 = 0$	$-4x + 2y - 8 = 0$
$+8$	$+8 \quad +8$
$-4x = 8$	$2y = 8$
$\dfrac{-4x}{-4} = \dfrac{8}{-4}$	$\dfrac{2y}{2} = \dfrac{8}{2}$
$x = -2$	$y = 4$

2. Rearrange the standard form equation given below into slope y-intercept form ($y = mx + b$), then graph the line on the grid provided. (4 marks)
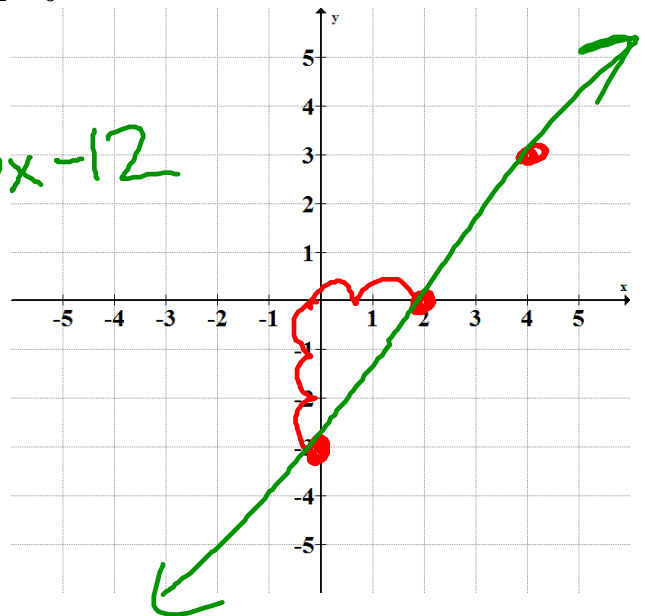
$$-6x + 4y + 12 = 0$$

$$-6x + 4y + 12 = 0$$
$$+6x \qquad -12 \qquad 6x - 12$$

$$\frac{4y}{4} = \frac{6x}{4} - \frac{12}{4}$$

$$y = \frac{6}{4}x - 3$$

$$y = \frac{3}{2}x - 3$$

3. Determine the equation of the line that goes through the points (-2, 8) and (7, -10). (4 marks)
YOU MUST DO THIS WITHOUT GRAPHING, SHOW ALL OF YOUR WORK

$(-2, 8)$ $(7, -10)$
x_1 y_1 x_2 y_2

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

$m = \dfrac{-10 - 8}{7 - -2}$

$m = \dfrac{-18}{9}$

$m = \boxed{-2}$

$y = mx + b$

$-10 = (-2)(7) + b$

$-10 = -14 + b$
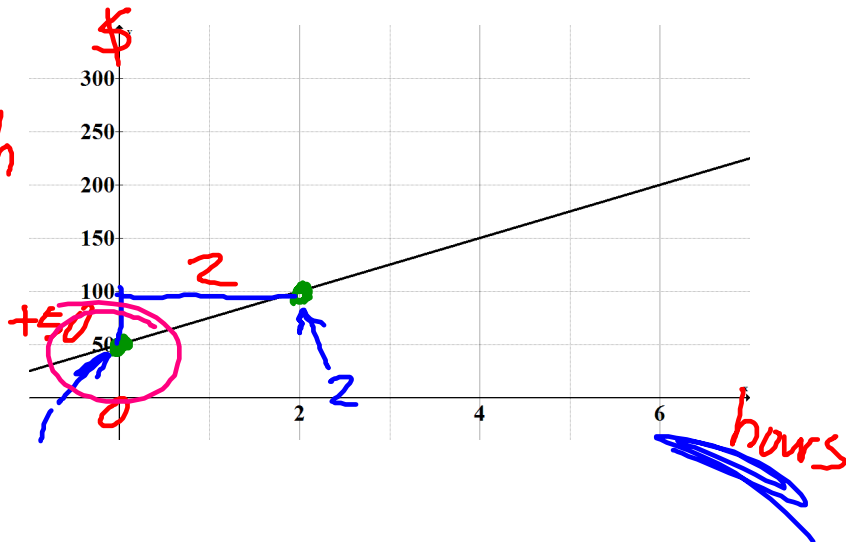$+14 \qquad +14$

$\boxed{4 = b}$

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

4. The graph below is used to determine the cost of a service call for furnace repairs. The x-axis represents the number of hours and the y-axis the total cost. (2 marks)

a. Determine the slope of the line.

$\dfrac{rise}{run} = \dfrac{50}{2} = \$25/h$

b. Write an equation that represents the cost of furnace repairs.

$\boxed{C = 25h + 50}$

Part C: Thinking Inquiry and Problem Solving

1. After trick or treating, Clark has 63 chocolate bars. He eats 7 per day.
   a) Write an equation to model the situation. (2 marks)

$$C = -7d + 63 \quad \rightarrow -7 \quad d$$

   b) How many chocolate bars does Clarke have left after 3 days? (1 mark)

$$C = -7d + 63 \quad \rightarrow d = 3$$
$$C = (-7)(3) + 63 \rightarrow C = 42$$
$$C = -21 + 63 \quad \therefore \text{he has 42 chocolate bars after 3 days.}$$

   c) After how many days does Clarke run out of chocolate bars? (1 mark)

$$C = -7d + 63 \quad \rightarrow C = 0$$
$$0 = -7d + 63 \qquad \frac{-63 = -7d}{-7 \quad -7} \qquad +9 = d$$
$$-63 \qquad +63$$

   After 9 days, Clarke will have no chocolate left

2. Determine the y-intercept of the line with a slope of 3 through the point (-2, 7).
   (2 marks)

$$y = mx + b$$
$$7 = (3)(-2) + b$$
$$7 = -6 + b \implies b = 13$$
$$+6 \qquad +6$$

3. The equation of a line is $y = -3x - 2$

   Determine the coordinates of any 3 different points that lie on this line. (3 marks)
   YOU MUST DO THIS WITHOUT GRAPHING, SHOW ALL OF YOUR WORK

$$y = -3(0) - 2 \qquad y = -3x - 2 \qquad 0, 1, 2$$
$$y = -2 \qquad (0, -2)$$

$$y = -3(1) - 2$$
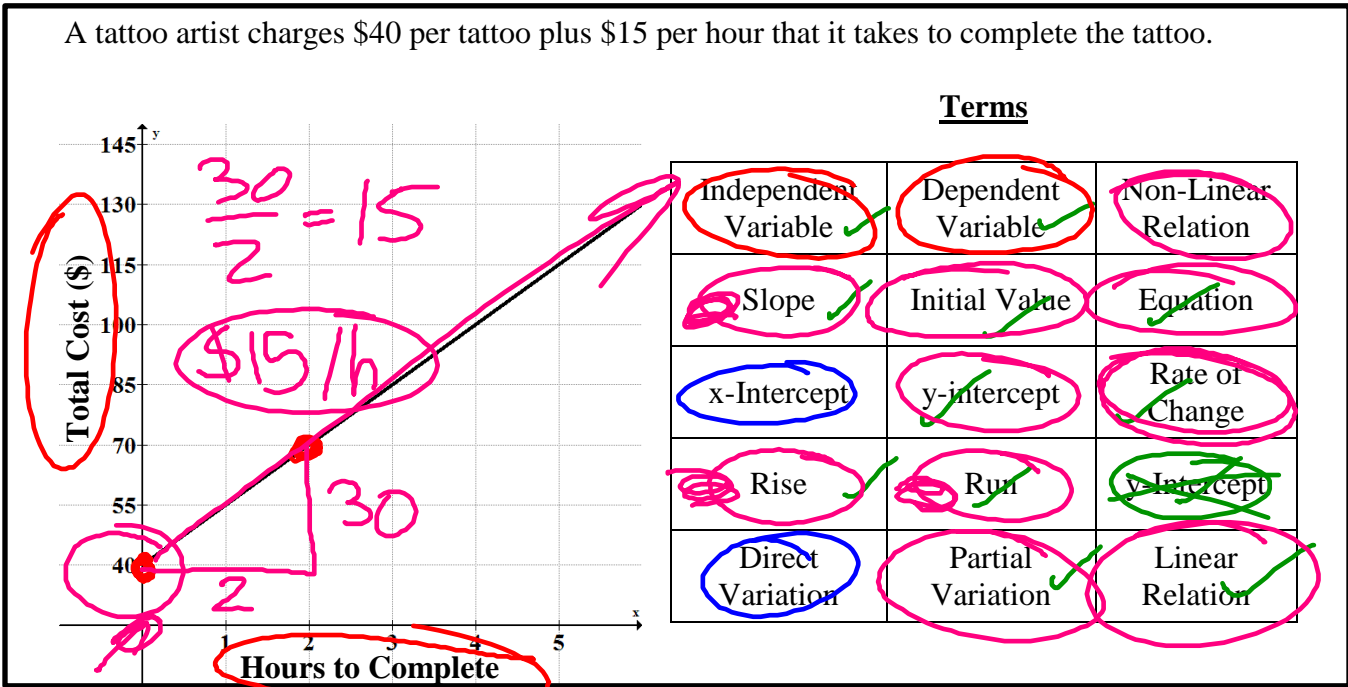$$y = -3 - 2 \quad (y = -5) \quad (1, -5) \qquad (2, -8)$$

Part D: Communication

1. Write a description of the situation below using **6** of the terms provided in the table. (3 marks)

A tattoo artist charges $40 per tattoo plus $15 per hour that it takes to complete the tattoo.

$$\frac{30}{2} = 15$$

$15/h

30

2

Total Cost ($)

Hours to Complete

Terms

Independent Variable	Dependent Variable	Non-Linear Relation
Slope	Initial Value	Equation
x-Intercept	y-intercept	Rate of Change
Rise	Run	y-Intercept
Direct Variation	Partial Variation	Linear Relation

$$C = 15h + 40$$

Describe or list the steps that you would take to sketch a graph of the line represented by the equation

$$y = -\frac{1}{3}x - 1.$$ (4 marks)

rise −1
run 3