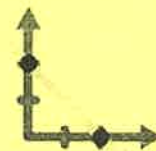




Foundations of Mathematics & Pre-Calculus 10 Linear Relations QUIZ



Name: KEY

Date: Jan 16

Block: 1

Teacher: Miss Zukowski

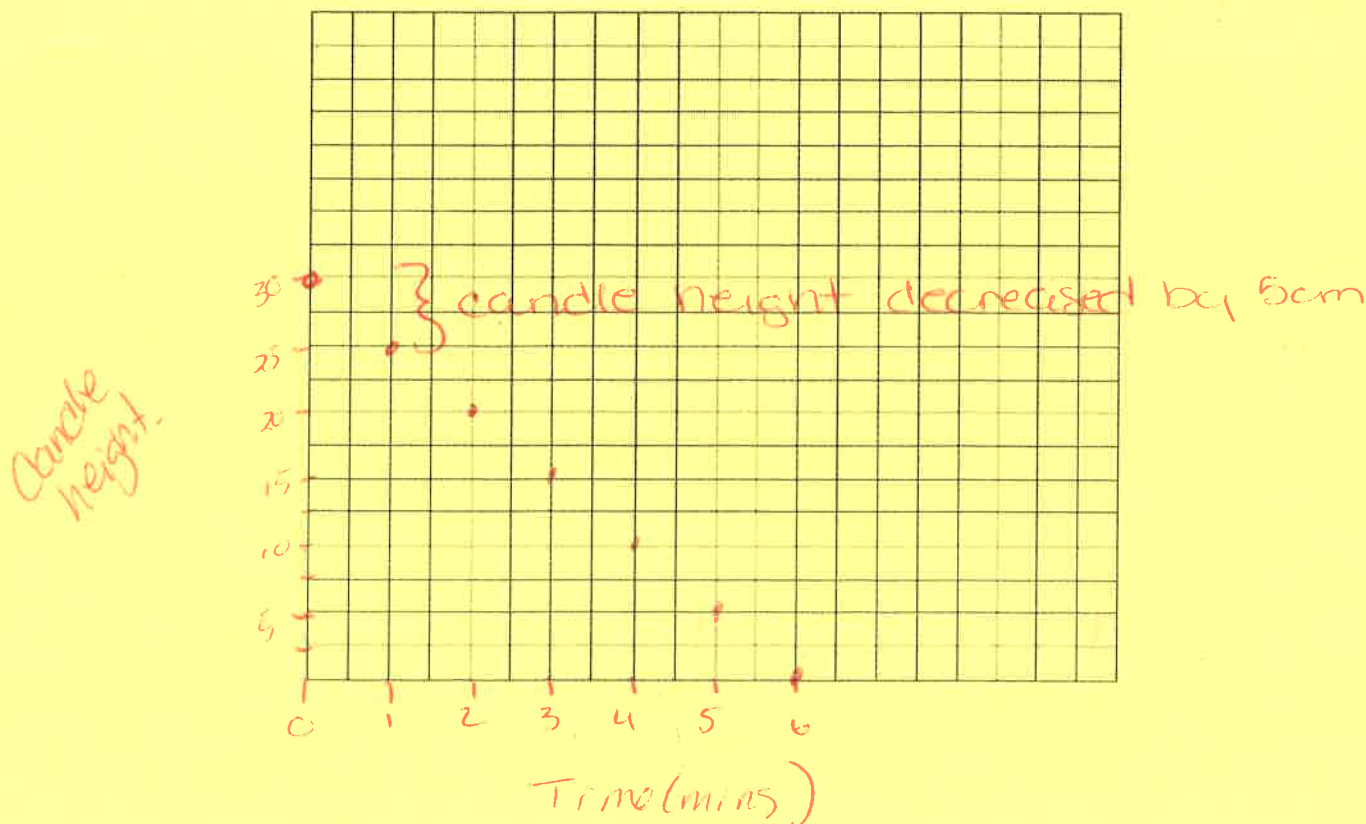
Results Summary: /55

1. If a candle starts out at a height of 30cm, and melts at a constant rate (5cm per hour)
 Construct a table of values and plot the relationship, $H = -5t$ if the domain is {0, 1, 2, 3, 4, 5, 6}

a. Complete the table of values (show all working out in the space provided) /4

t	H	
0	0	
1	-5	$= -5(1)$
2	-10	$= -5(2)$
3	-15	$= -5(3)$
4	-20	$= -5(4)$
5	-25	$= -5(5)$
6	-30	$= -5(6)$

b. Plot the relationship $H = -5t$ (be sure to appropriately label axis) /3



2. Complete the Table of Values and graph the following equations. State whether or not the equation represents a linear relationship (circle the correct answer).

a.

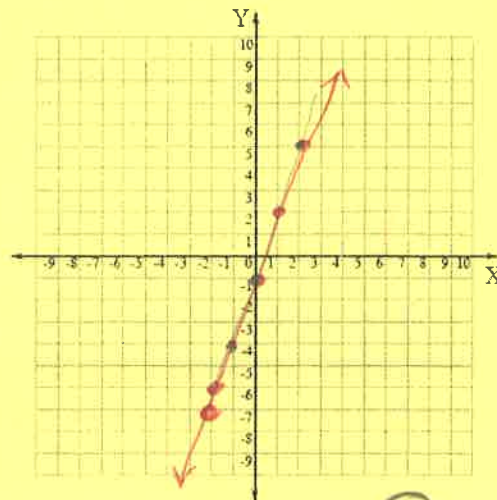
$y = 3x - 1$	
x	y
-2	-7
-1	-4
0	-1
1	2
2	5
3	8

$$3(-2) - 1 = -7$$

$$3(-1) - 1 = -4$$

$$3(1) - 1 = 2$$

$$3(2) - 1 = 5$$



Is $y=3x-1$ a linear relation? YES NO

/5

b.

$y + 4 = -3(x + 6)$	
x	y
-10	8
0	-22

$$y = -3x - 18 - 4$$

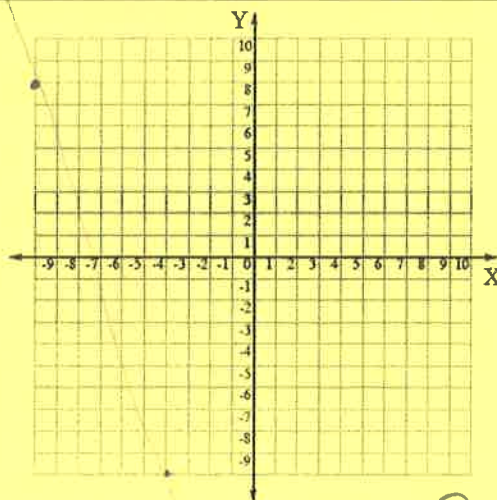
$$y = -3x - 22$$

$$0 + 4 = -3x + 18$$

$$+18$$

$$\frac{22}{-3} = x$$

$$x = -7.3$$



Is $y+4 = -3(x+6)$ a linear relation? YES NO

/5

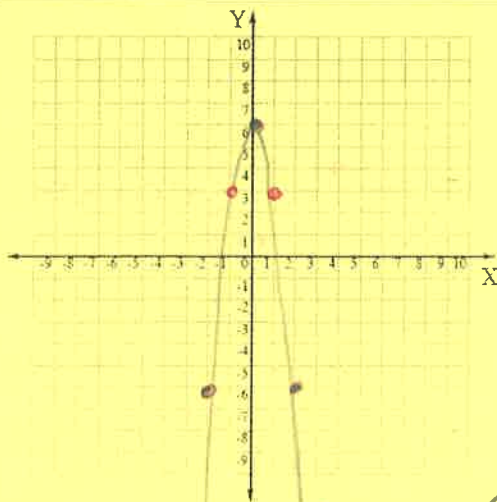
c.

$y - 6 = -3x^2$	
x	y
-2	-6
-1	3
0	6
1	3
2	-6
3	-21

$$y = -3x^2 + 6$$

$$y = -3(-1)^2 + 6 = 3$$

$$y = -3(3)^2 + 6 = -21$$



Is $y-6 = -3x^2$ a linear relation? YES NO

/5

d. Had you **NOT** graphed the equations above, **explain** another method for determining if a relation is linear or not. /2

• if x has an exponent > 1 = not linear eg x^2

• if x is a multiple of another variable eg xy = not linear.

2. Calculate the x-intercept and y-intercept and write as coordinates.

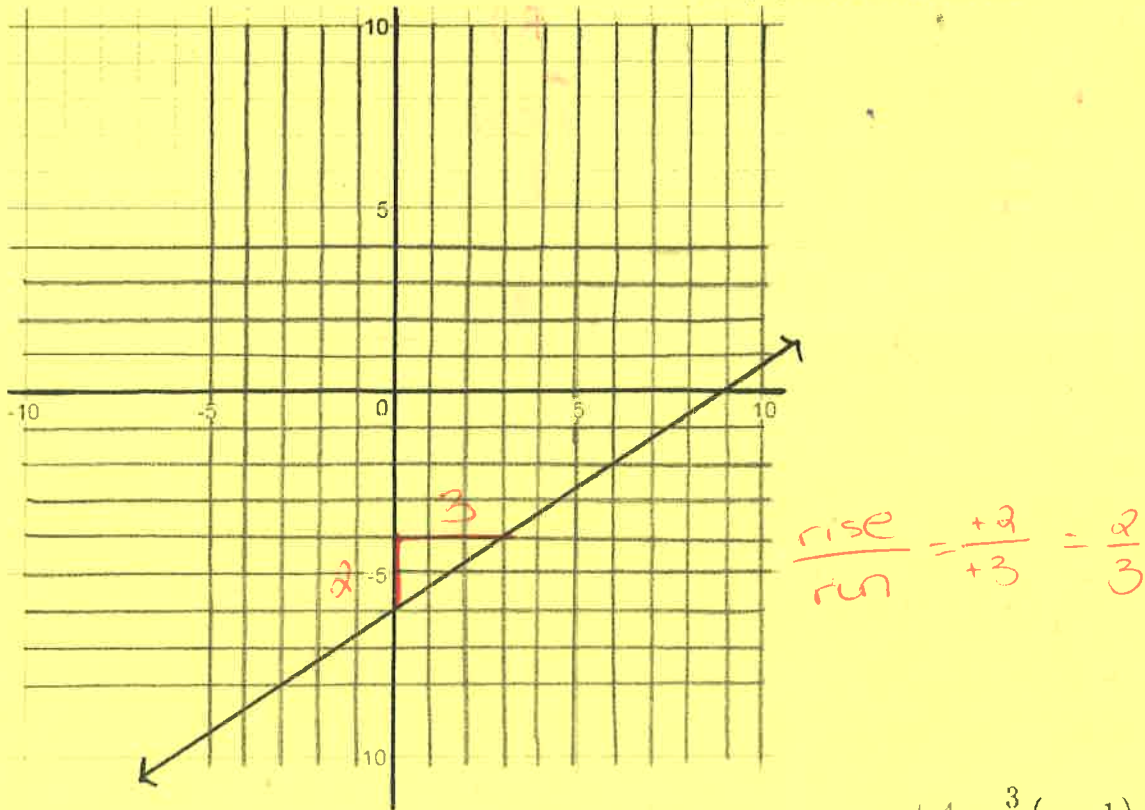
a. $2x - 9y = -4$

<p><u>x int</u></p> $2x - 9(0) = -4$ $2x = -4$ $\frac{2x}{2} = \frac{-4}{2}$ $x = -2$ <p>$(-2, 0)$</p>	<p><u>y int</u></p> $2(0) - 9y = -4$ $-9y = -4$ $y = \frac{-4}{-9} = \frac{4}{9}$ <p>$(0, \frac{4}{9})$</p>	/4
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b. $\frac{1}{2}x - \frac{2}{3}y = 6$

<p><u>x int</u></p> $\frac{1}{2}x - (0)\frac{2}{3} = 6$ $\frac{1}{2}x = 6$ $x = 12$ <p>$(12, 0)$</p>	<p><u>y int</u></p> $\frac{1}{2}(0) - \frac{2}{3}y = 6$ $-\frac{2}{3}y = 6$ $y = -9$ <p>$(0, -9)$</p>	/4
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3. Determine the **slope of the line** shown below, graphically. (HINT: draw on the graph) /1



4. Convert into slope intercept form and state the slope of the line: $y + 4 = \frac{3}{5}(x - 1)$ /2

$m = \frac{3}{5}$	$y = \frac{3}{5}x - \frac{3}{5}$	$y + 4 = \frac{3}{5}(x - 1)$ $y = \frac{3}{5}x - \frac{3}{5} - 4$ $y = \frac{3}{5}x - \frac{17}{5}$ <p>$(3\frac{2}{5})$ (3.4)</p>
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5. A line passes through the points (2,4) and (6,6).

a. Find the **slope** of the line

b. Determine if the point **(-4,5)** is also on the line

$$m = \frac{6-4}{6-2} = \frac{2}{4} = \frac{1}{2}$$

①

~~$$\frac{1}{2} = \frac{6-4}{6-2}$$~~

$$6 = 2(6-y)$$

$$6 = 12 - 2y$$

$$-12 \quad -12$$

$$\frac{-6}{-2} = \frac{-2y}{-2}$$

$$3 = y$$

②

$$y = mx + b$$

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

$$(5) = \frac{1}{2}(-4) + 3$$

$$5 = -2 + 3$$

$5 \neq 1$
not on line

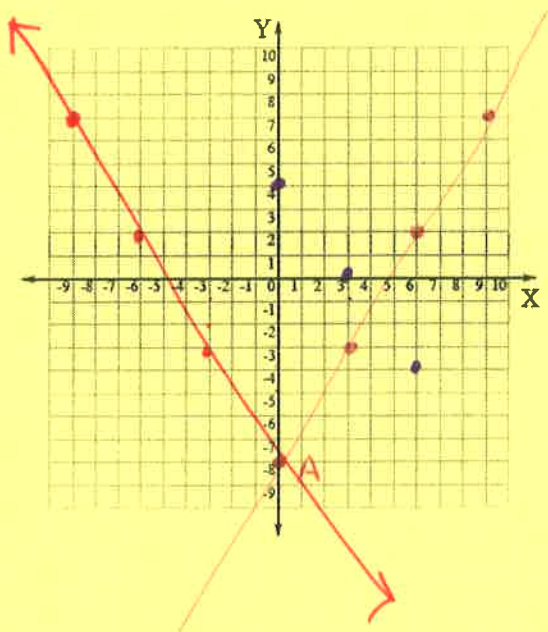
③

/3

6. The **slope** of a line is **-5/3** and passes through the point **A(0, -8)** and **B(-3, y)**.

(solve graphically or algebraically...a Cartesian plane is provided should you wish to graph)

/2



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

$$\frac{-5}{3} = \frac{-8 - y}{0 - (-3)}$$

①

$$-5(0 - (-3)) = 3(-8 - y)$$

$$0 + 15 = -24 - 3y$$

~~$$15$$~~

$$+24$$

$$\frac{39}{-3} = \frac{-3y}{-3}$$

$$-13 = y$$

②

7. Use the equation of the line $y = -\frac{4}{3}x + 4$ to answer the following questions:

a. Determine if the point (6, -4) is on the line

b. **Explain** how you know:

$$(-4) = -\frac{4}{3}(6) + 4$$

$$-4 = -8 + 4$$

$$-4 = -4 \quad \checkmark \text{ yes.}$$

when (6, -4) are substituted into the equation $y = -\frac{4}{3}x + 4$, the equation is true, $-4 = -4$.

/3

8. Match each linear equation with the correct graph of the function. Choose from the equations provided below and write the correct equation in the box of its matching graph. /4

~~$y = 2x - 1$~~

~~$y = \frac{1}{3}x + 1$~~

$y = -x - 1$

~~$y = 3x - 1$~~

<p>Graph A</p> <p>$y = 3x - 1$</p>	<p>Graph C</p> <p>$y = 2x - 1$</p>
<p>Graph B</p> <p>$y = \frac{1}{3}x + 1$</p>	<p>Graph D</p> <p>$y = -x - 1$</p>

9. A line has a slope of -3 and passes through the point $(5, -5)$.

a. Use algebraic methods to find ANY other point on the line /2

b. Graph the line on the axis below /2

$m = -3$

$$\frac{-3}{1} = \frac{-5 - y}{5 - 0}$$

$$-3(5 - 0) = -5 - y$$

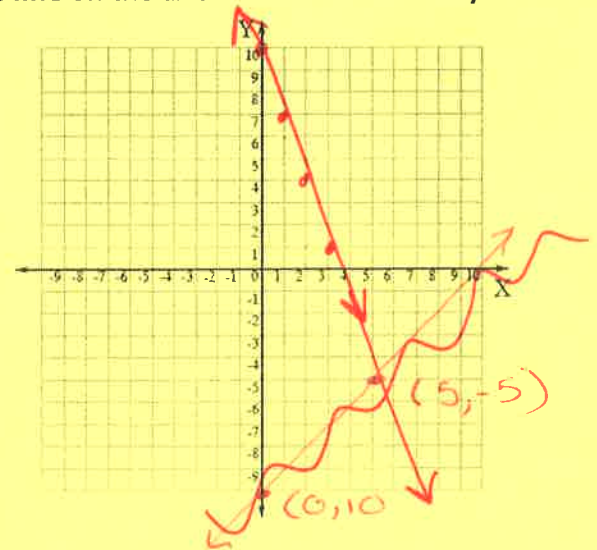
$$-15 - 0 = -5 - y$$

$$+5 \quad +5$$

$$10 = -y$$

$$\therefore y = -10$$

$(x, y) = (0, -10)$



c. Find the y-intercept /1

d. Write the equation in Slope Intercept Form /1

$y = 10$

e. Find the x-intercept /2

$$y = -3x + 10 \quad (1)$$

$$0 = -3x + 10$$

$$-10 = -3x$$

$$\frac{-10}{-3} = \frac{-3x}{-3}$$

$$x = \frac{10}{3} = 3.\overline{33} \quad (2)$$

$y = -3x + 10$

azukowski

Lunch - 311



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