Math 10 Foundations LG 9/10 Quiz Ver. A Answer Sheet

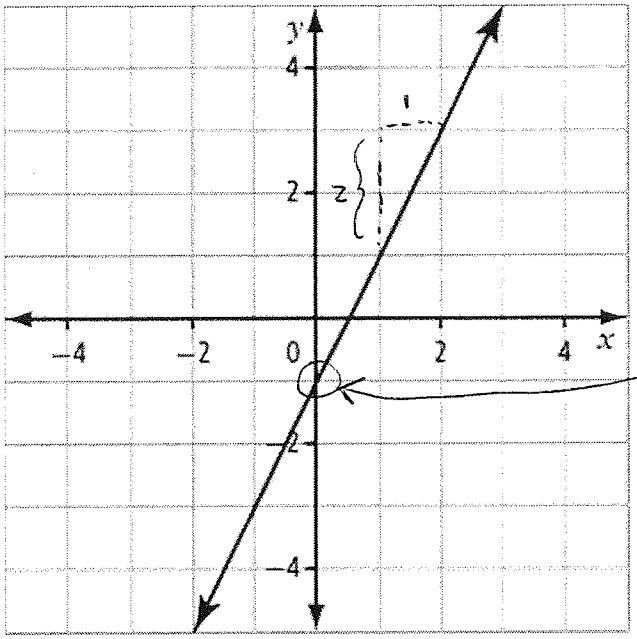
Instructions

1. **Mark your quiz.**
2. **Complete the "How Did I Do?" sheet.**
3. **Return this sheet to Mrs. Craig.**
4. **Bring your marked quiz and the "How Did I Do?" page to your teacher for a quick interview.**

Foundations of Math 10 LG 9/10 Ver A /25

1. **Expectation #1: Identify the slope and y-intercept of a straight-line graph.**

   What are the slope and *y*-intercept of this line? **(1 mark)**



Slope: $\frac{\text{rise}}{\text{run}} = \frac{2}{1} = 2$

y-intercept: -1

2. **Expectation #2: Use slope-intercept form to graph, determine a line's equation, and solve problems.**

   Write the slope-intercept form of the equation of the line with slope = 3 and *y*-intercept = 2. **(1 mark)**

$y = mx + b$

$m = 3$, $b = 2$

So, $y = 3x + 2$

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3. Identify the slope and y-intercept of the relation represented by the equation $2x - 2y + 3 = 0$. **(1 mark)**

Find the slope and y-intercept form:

$2x - 2y + 3 = 0$

$-2x \quad -2y + 3 = -2x \quad -3$

$-2y = -2x - 3$

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

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

slope: $m = 1$

y-intercept $= \frac{3}{2}$ OR $1\frac{1}{2}$

4. The equation of the line through the point (2, 3) with slope –2 is: **(1 mark)**

Use point-slope eqn: $y - y_1 = m(x - x_1)$

$y - 3 = -2(x - 2)$

$y - 3 = -2x + 4$

$y = -2x + 7$ (slope y-intercept form)

OR $2x + y - 7 = 0$ (general form)

5. **Expectation #3: Convert a linear equation to general form and use it to solve problems.**

Write the equation in general form for the line with slope 3 and y-intercept –4. **(1 mark)**

use slope y-intercept form: $y = mx + b$

$y = 3x - 4$

General Form: $3x - y - 4 = 0$

6. **Expectation #4: Use intercepts to graph a line and relate the intercepts to a situation.**

Determine the x-intercept of the line $y = 1 - x$. **(1 mark)**

x-intercept means the y value must be zero (0)!

So, $0 = 1 - x$

$-1 \quad -1$

-1

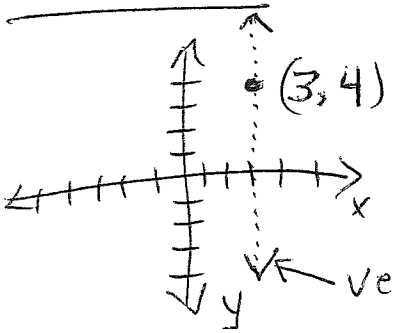
$(-1) \quad -1 = -x(-1)$

$1 = x$

/4

7. What is the equation of the vertical line that passes through the point (3, 4)? **(1 mark)**

Use Diagram: ?



vertical line!

So, $x = 3$ and y can have any value!

or General Form: $x - 3 = 0$

8. What is the *y*-intercept of the line $y = -4x - 7$ **(1 mark)**

↑ by definition, b = y-intercept when equation is written as: $y = mx + b$

So, y-intercept = -7

9. What is the value of *p* in the equation of the line $px + 2y + 8 = 0$, such that the *x*-intercept is 4? **(1 mark)**

If x intercept is 4, then by definition the y value must be zero (0); or the question is asking for p value at (4, 0)!

So substitute (4, 0) into:

$px + 2y + 8 = 0$

$p(4) + 2(0) + 8 = 0$

$4p + 8 = 0$

$-8 \quad -8$

$4p = -8$

$\div 4 \quad \div 4$

$p = -2$

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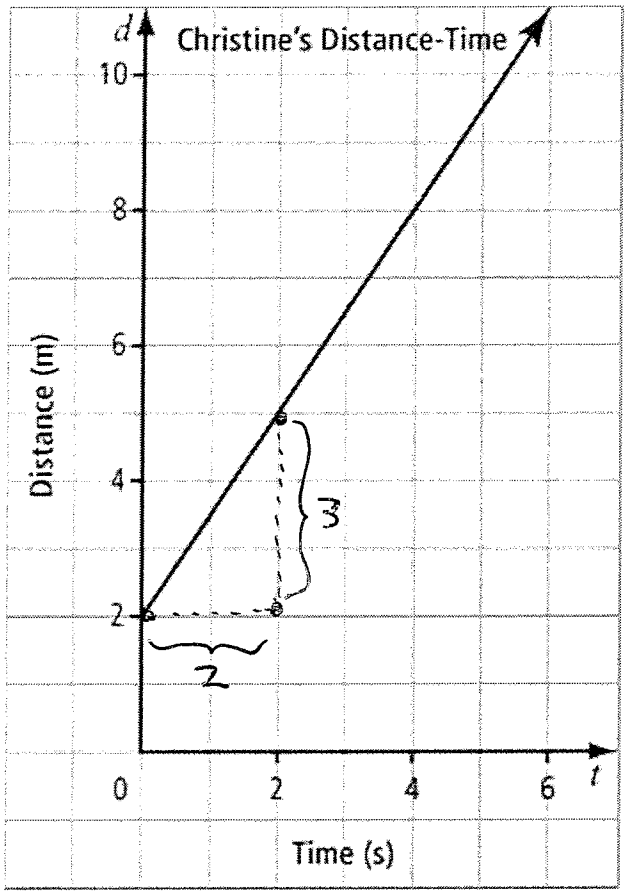
10. The distance-time graph illustrates Christine's walk in front of a motion sensor. Her distance from the sensor, in metres, is represented by the variable d, and time, in seconds, is represented by t. **(3 marks)**



a) State the slope and explain what it represents.

$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5-2}{2-0} = \frac{3}{2} = 1\frac{1}{2}$

So, slope = $\frac{3}{2}$ or $1\frac{1}{2}$

this means that every 2 seconds she walks 3 metres OR every 1 second she walks 1.5 metres OR speed = 1.5m/s (1.5 metres per second)

b) Write an equation in the form $d = mt + b$ that describes Christine's walk.

this is same as: $y = mx + b$ ← 1.5, 2

OR $d = 1.5t + 2$

c) When was Christine 6 m from the sensor?

use equation: $d = 1.5t + 2$, and solve for t

(t is in seconds): $6m = 1.5t + 2$

$-2 \quad -2$

$4 = 1.5t$

$\div 1.5 \quad \div 1.5$

$2.6 \text{ secs} = t$ OR $t = 2.7$ secs.

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11. Expectation #5: Use slope-point form to determine a line's equation, and solve problems.

Determine an equation for the line with slope 3 and passing through the origin. **(1 mark)**

Use point-slope equation: $y - y_1 = m(x - x_1)$ when $m = 3$ and point $(0,0)$ (origin)

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

$y = 3x$ - slope y-int. form

OR

12. What is an equation for the line that passes through points (–1, –2) and (3, 4)? **(1 mark)**

Step 1. Find the slope: (x_1, y_1) (x_2, y_2)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4-(-2)}{3-(-1)} = \frac{6 \div 2}{4 \div 2} = \frac{3}{2}$$

Step 2. Use point-slope formula:

$y - y_1 = m(x - x_1)$

$\left[y + 2 = \frac{3}{2}(x+1)\right]\frac{2}{1}$

$2y + 4 = 3(x+1)$

$2y + 4 = 3x + 3$

$-4 \quad -4$

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

$y = \frac{3}{2}x - \frac{1}{2}$ OR

$3x - 2y - 1 = 0$ General Form

13. Using the table of values, determine the equation of the line. **(1 mark)**

x	y	
0	–9	3 = m
1	–6	3 = m
2	–3	3 = m
3	0	3 = m
4	3	

Step 1. - Find the slope: $m = \frac{y_2 - y_1}{x_2 - x_1}$

$= \frac{-6-(-9)}{1-0}$

$= \frac{-6+9}{1} = \frac{3}{1} = 3$

Step 2: The y intercept is = –9 because $x = 0$ when $y = -9$!

So, Equation of line: $y = mx + b$

OR $y = 3x - 9$

OR $3x - y - 9 = 0$ (General Form)

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14. Danny works at a parking lot, where he can park his own car at a discounted rate. Whether he is working or not, he pays a flat fee of $2.00 plus $0.25 per hour that his car is parked. **(3 marks)**

a) Write a linear equation to represent Danny's total parking cost, C, in dollars, for t hours.

THINK this equation is very similar to $y = mx + b$
but C is y and t is the x variable:
so, $C = 0.25t + 2$ → Danny's total parking cost

b) How much will it cost Danny to park his car for a full 24 h?

Use eqn: $C = 0.25t + 2$ and substitute 24 for "t":
so, $C = 0.25(24) + 2$
$C = 6 + 2$
$C = 8$ OR Danny will pay $8.00

c) If Danny has $6.00, for how many hours can he park his car in the parking lot

Use eqn: $C = 0.25t + 2$
$6 = 0.25t + 2$
$-2 \quad -2$
$4 = 0.25t$
$\div 0.25 \quad \div 0.25$
$16 = t$
→ Danny can park for 16 hours for $6.00

15. **Expectation #6: Identify whether two lines are parallel, perpendicular, or neither.**

The slopes of a pair of lines are provided. Decide whether the lines are parallel, perpendicular, or neither. Justify your answer. **(1 mark)**

$m = \frac{3}{4}$ and $m = \frac{12}{16}$

Check if slopes are equal:

$\frac{3}{4} = \frac{3}{4}$ because $\frac{12 \div 4}{16 \div 4} = \frac{3}{4}$

OR $\frac{3 \times 4}{4 \times 4} = \frac{12}{16}$

$\frac{12}{16} = \frac{12}{16}$

So, Both lines are parallel

because $\frac{3}{4}$ and $\frac{12}{16}$ have the same value.

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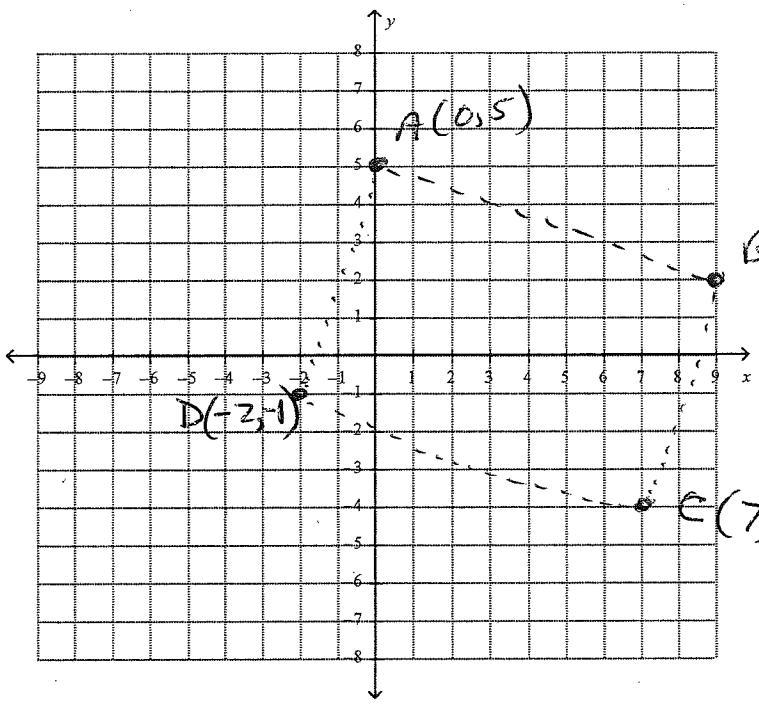
16. The vertices of quadrilateral ABCD are: A (0, 5), B (9, 2), C (7, –4), and D (–2, –1). Plot the points and then use your knowledge of slopes of line segments to determine if ABCD is a rectangle. Explain your method. **(2 marks)**



Slope AB $= \frac{y_2 - y_1}{x_2 - x_1} = \frac{2-5}{9-0}$

$= -\frac{1}{3}$

Slope BC $= \frac{-4-2}{7-9}$

$= 3$

Slope CD $= \frac{-1-(-4)}{-2-7}$

$= -\frac{1}{3}$

Slope DA $= \frac{5-(-1)}{0-(-2)}$

$= 3$

ABCD is a parallelogram because opposite sides have equal slopes but ABCD is also a rectangle since adjacent sides have negative reciprocal slopes: (ie) $3 \rightarrow -\frac{1}{3}$

17. Expectation #7: Write the equation for, and solve problems involving parallel and perpendicular lines.

What is the equation of the line that passes through (3, –1) and is parallel to the line y = 3x + 2? **(1 mark)**

Use point slope formula where $m = 3$ and point value is $(3, -1)$:

$y - y_1 = m(x - x_1)$

$y - (-1) = 3(x - 3)$

$y + 1 = 3x - 9$

$-1 \quad -1$

$y = 3x - 10$ (slope y-intercept form)

OR $3x - y - 10 = 0$ (General Form)

18. State the slope of the line that is perpendicular to the line $y = \frac{2}{5}x - 3$ **(1 mark)**

A perpendicular line has a negative reciprocal slope of the original line:

so slope of perp. line to $\frac{2}{5}$ is $-\frac{5}{2}$

19. Write the equation of the line parallel to $y = 2x - 4$ and with the same x-intercept as $3x - 4y = 12$. **(1 mark)**

Step 1: By definition, x-intercept of $3x-4y=12$ has (4,0) as a point of solution: $3x-4(0)=12$, $3x=12$, $x=4$

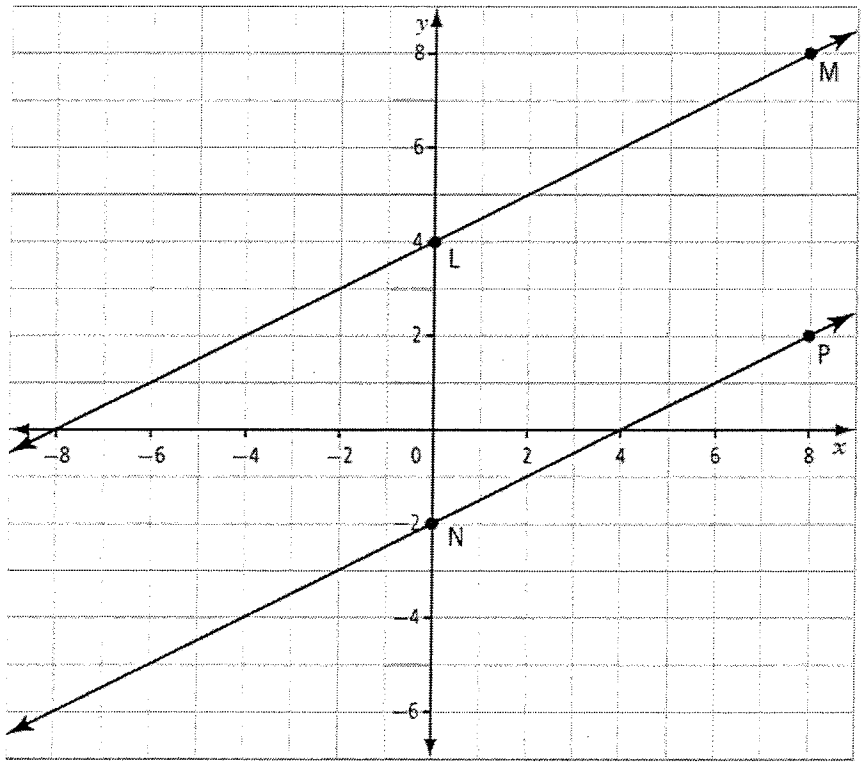
Step 2: Use point slope Formula: $m=2$

$y-0=2(x-4)$

$y=2x-8$ OR $2x-y-8=0$

(slope y-intercept form) (General Form)

20. In the graph, the equation of the line containing LM is $y = 0.5x + 4$. The two lines are parallel. What is the equation of the line containing NP? **(1 mark)**



We use slope y-intercept form: $y = mx + b$

We know the slope is 0.5

for both lines and the y-intercept of NP is -2

so, equation is: $y = 0.5x - 2$ (slope y-intercept form)

OR $0.5x - y - 2 = 0$ (General Form)