Algebra I

Exam #3-Linear Functions

Name:

Winter 2010, Mr. Burdick

Hour:

Date:

Total Score: (35 Points Possible)……………………………………………………………….

Selected Response Clear Purpose:

This formative task was developed to assess the knowledge and understanding of key components that high school students would need in order to understand the basics of linear functions. The purpose of the assessment is to help the instructor determine if the students understand the key concepts of linear functions by analytical, graphical and table interpretations at this point of the unit. Another purpose of this formative assessment is to give students a feedback on their knowledge/understanding of linear functions that they will need to know before they can effectively move on further in mathematics.

Michigan Standards/Benchmarks:

StandardA3: Families of Functions

- **A3.1 Lines and Linear Functions**
    - A3.1.1: Write the symbolic forms of linear functions (standard, point-slope, and slope-intercept) given appropriate information and convert between forms.
    - A3.1.2: Graph lines (including those of the form $x = h$ and $y = k$) given appropriate information.
    - A3.1.3: Relate the coefficients in a linear function to the slope and x- and y-intercepts of its graph.
    - A3.1.4: Find an equation of the line parallel or perpendicular to given line, through a given point; understand and use the facts that non-vertical parallel lines have equal slopes, and that non-vertical perpendicular lines have slopes that multiply to give -1.

Algebra I

Clear Targets:

Learning Targets	Knowledge Questions	Reasoning Questions
I can solve each of the symbolic forms of linear functions (standard, point-slope, and slope intercept) analytically and switch between each one if one is already given.		7, 11-13, 21-23
I can analytically solve for the slope of a line if given two points.		6, 13-25
I can define the terminology for this unit, like slope, parallel equation, perpendicular equation etc.	1-5	
I can form a liner function line by graphical and table interpretations		6, 16-20
I can find an equation that is either parallel or perpendicular to the given line.		8-9, 14-15, 24-25

Directions:

- We have been discussing the basics of linear functions by analytical, graphical and table interpretations at this point of the unit. We have found equations of lines from tables and graphs by computing the slope and y-intercept and work with the different symbolic forms of linear functions. Also, we know how to compute the parallel and perpendicular line to a given equation. This exam is designed to see how much you know about this unit by indentifying the different forms of linear functions, how to compute the linear functions by using graphs and tables, and finding the parallel and perpendicular equations to a given equation.

- There are 5 different sections on this test- **2 Matching sections (1 point each), 1 True/False section (1 point each), and 2 Multiple Choices sections (2 points each).**

- This test is worth 35 points and please put your name, hour and date in the upper left corner. Please place your answers on the answer sheet.

- After each question, you will be asked whether you were sure or unsure of your answer. Make an "X" or checkmark whether you are sure or unsure of the answer to each question.

- Unless otherwise stated, you may use a graphing calculator to assist you on any question. However, using symbolic manipulating capabilities of calculators, such as the **TI-89 or TI-92 is not permitted.**

- The use of **a note sheet or external aid of any type** on this exam is **NOT permitted.**

- Once you are completed, look over the test again and double check your work. After this, quietly walk up to my desk and place the test in the basket for your class. Then, you can start working on the next investigation in your textbook or work on the practice problems that were just assigned. Please be quiet since every student deserves a quiet environment for this assessment.
- Take your time; you have the rest of the class period to complete this test. Don't rush and Good Luck! If you have any questions, raise your hand and I will assist/clear up any misunderstandings.

Part I: Fill in the Blank/Matching (1 point each) for questions 1-5, on your answer sheet, fill in the missing word that would complete the sentence. The key terms will be in the word bank. Each concept will only be used once but except one. Also, make sure you check or mark if you are sure or unsure about the answer.

1. The equation that has the same slope as the given equation and has a different y-intercept is a _____.
   Sure:_____   Unsure:_____
2. The_____ is $y = mx + b$.
   Sure:_____   Unsure:_____
3. To find slope, we find _____.
   Sure:_____   Unsure:_____
4. The Standard formula is _____.
   Sure:_____   Unsure:_____
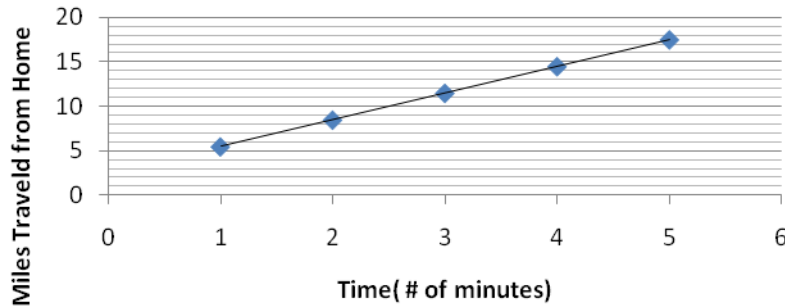5. The _____ is $y - y1 = m(x - x1)$.
   Sure:_____   Unsure:_____

Word Bank

A. $\frac{\Delta y}{\Delta x}$

B. Point slope formula

C. Parallel equation

D. Slope Intercept formula

E. $Ax + By = C$

F. The equation that has that has the opposite reciprocal slope to the given equation.

Part II: True or False (1 point each): for questions 6-10, answer the true/false statement by analyzing and interpreting the data table and graph carefully. Then read each statement. If the statement is true, circle the word "TRUE" and fill in letter A on your answer sheet. If the statement is false, circle the word "FALSE" and fill in letter B on your answer sheet. Also, make sure you check or mark if you are sure or unsure about the answer.

Over the River and Through the Wood to Grandma's House We Go!

Time (# of minutes)	Miles Traveled from Home
0	2.5
1	5.5
2	8.5
3	11.5
4	14.5
5	17.5

6. From the graph above, the slope of the line is 2(2x), meaning the car is traveling 2 miles per minute.

      A. True   B. False

Sure: _____   Unsure: _____

7. From the graph above, the slope intercept formula for the line is y = 3x+2.5

      A. True   B. False

Sure: _____   Unsure: _____

8. A parallel equation to the given equation is y = 3x+ 100

      A. True   B. False

Sure: _____   Unsure: _____

9. A perpendicular equation to the given equation is $y = \frac{2}{3}x + 2.5$

      A. True   B. False

Sure: _____   Unsure: _____

10. The y intercept of the equation is 2.5 and the x-intercept is 0.

      A. True   B. False

Sure: _____   Unsure: _____

Algebra I

Part III: Multiple Choices (2 point each): for questions 11-15, answer the question for each problem by filling in the corresponding letter and filling in the bubble on your answer sheet. You may use a scrap piece of paper to solve these problems. Also, make sure you check or mark if you are sure or unsure about the answer.

11. What is the slope of the given equations, $8x + 8y = -9$?

   a. $\frac{9}{3}$

   b. $\frac{8}{3}$

   c. 1

   d. $-\frac{8}{3}$

   Sure: _____   Unsure: _____

12. What is the slope of the given equations, $-2y - 10 + 2x = 0$?

   a. -1

   b. $\frac{10}{2}$

   c. 1

   d. $\frac{1}{2}$

   Sure: _____   Unsure: _____

13. What is the slope-intercept formula for the line that passes through these point, (3,-20) and (5, 8)?

   a. $y = -14x + 62$

   b. $y = 12x + 30$

   c. $y = 28x - 50$

   d. $y = 14x - 62$

   Sure: _____   Unsure: _____

14. What is parallel formula for the line that pass through same point, (3,-20) and (5,8)?

   a. $y = 14x + 62$

   b. $y = 12x + 30$

   c. $y = 28x - 20$

   d. $y = 2x - 62$

   Sure: _____   Unsure: _____

15. What is perpendicular equation for the line that passes through these points, (9, 3) and (19,-17)?

a. $y = -5\frac{2}{3}x - 12$

b. $y = \frac{1}{2}x + 21$

c. $y = 2x + 10$

d. $y = -2x+21$

Sure: _____   Unsure: _____

Part IV: Matching (1 point each): for questions 16-20, DO NOT use your Calculator. You may use a scrap piece of paper. On your answer sheet, please fill in the bubble that matches graph (the left column) with the correct equation (the right column). Each concept will only be used once but except one. Also, make sure you check or mark if you are sure or unsure about the answer.

16.
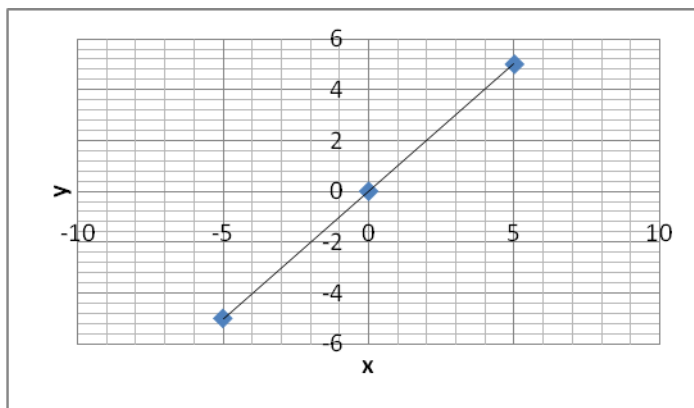
Sure: _____   Unsure: _____

17.

Sure: _____   Unsure: _____

Word Bank

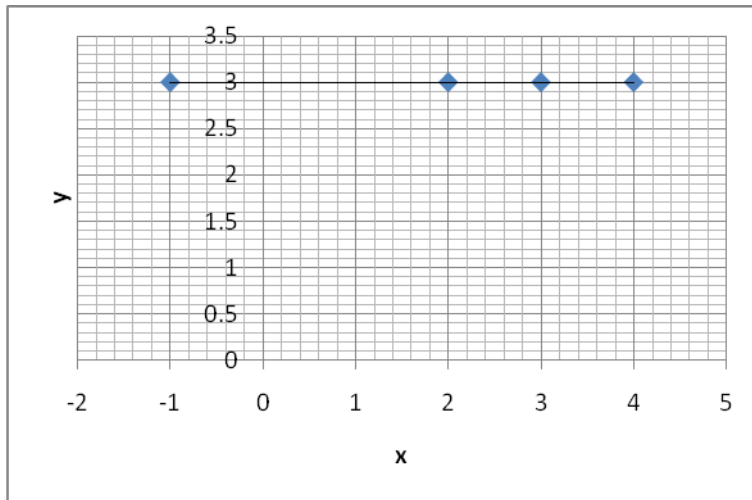A. y= $-\frac{4}{5}$x-2.6

B. y= 3
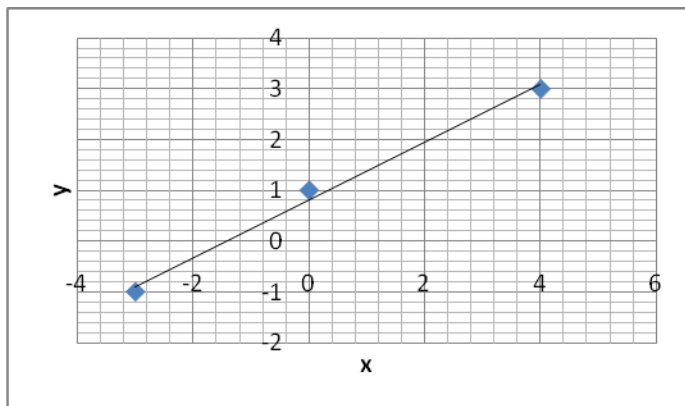
C. y= $\frac{2}{5}$x+-2.8

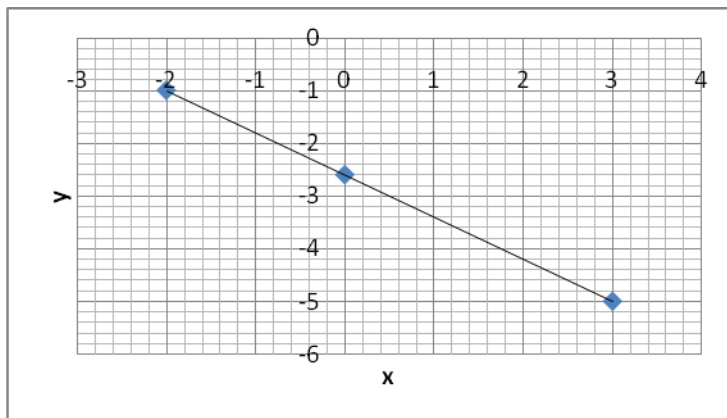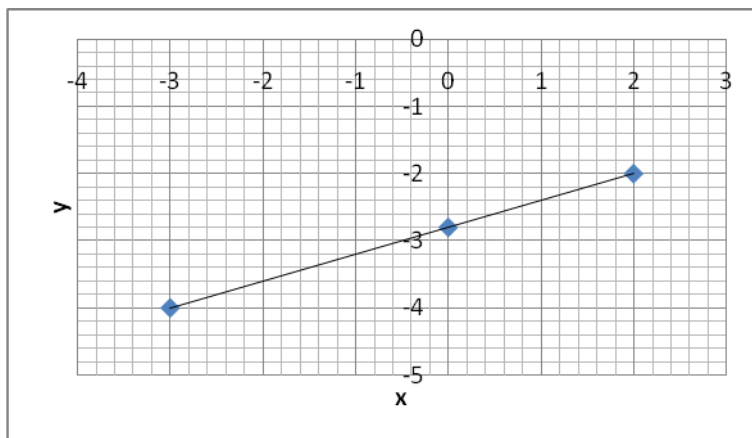D $y = 1x + 0$

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

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

18.

Sure: _____   Unsure: _____

19.

Sure: _____   Unsure: _____

Word Bank

A. y= $-\frac{4}{5}$x-2.6

B. y= 3

C. y= $\frac{2}{5}$x+-2.8

D $y = 1x + 0$

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

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20.

Part V: Multiple Choices (2 point each): for questions 21-25, answer the question for each problem by filling in the corresponding letter and filling in the bubble on your answer sheet. You may use a scrap piece of paper to solve these problems. Also, make sure you check or mark if you are sure or unsure about the answer.

21. What is the slope intercept formula of the given equations, $3x - 2y = -16$?

    a. $y = -8x - 16$

    b. $y = \frac{3}{2}x + 8$

    c. $y = -\frac{3}{2}x + 8$

    d. $y = 8x + 16$

    Sure: _____   Unsure: _____

22. What is the slope of the given equations $x - 3y = 6$

    a. -1

    b. -3

    c. 3

    d. $\frac{1}{3}$

    Sure: _____   Unsure: _____

23. What is the standard formula for the line that pass through these point, (1,-2) and has a slope of 7?

    a. $2x - y = 2$

    b. $7x - y = 5$

    c. $7x + y = 5$

    d. $y = 7x - 5$

    Sure: _____   Unsure: _____

24. What is parallel formula for the line that pass through same point, (1,-2), in slope-intercept formula?

    a. $y = 7x + 15$

    b. $y = \frac{5}{7}x + 5$

c. $y = 7x - 5$

d. $y = 2x - 2$

Sure: _____   Unsure: _____

25. What is perpendicular equation for the line that pass through these point, (6, 3) and (10, 5)?

a. $y = 2x + 0$

b. $y = \frac{1}{2}x + 0$

c. $y = -2x + 10$

d. $y = $ -2x+0

Sure: _____   Unsure: _____

Answer Key

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1. The equation that has the SAME slope as the given equation and has a different y-intercept is a **C. Parallel Equation** .

    Sure: _____   Unsure: _____

2. The **D. Slope- Intercept formula** is $y = mx + b$

    Sure: _____   Unsure: _____

3. To find slope, we find **A.** $\frac{\Delta y}{\Delta x}$.

    Sure: _____   Unsure: _____

4. The Standard formula is **E.** $Ax + By = C$.

    Sure: _____   Unsure: _____

5. The **B. Point Slope Formula** is $y - y1 = m(x - x1)$.

    Sure: _____   Unsure: _____

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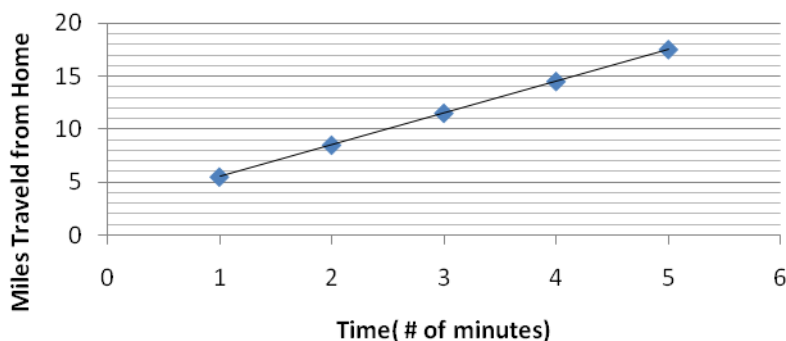
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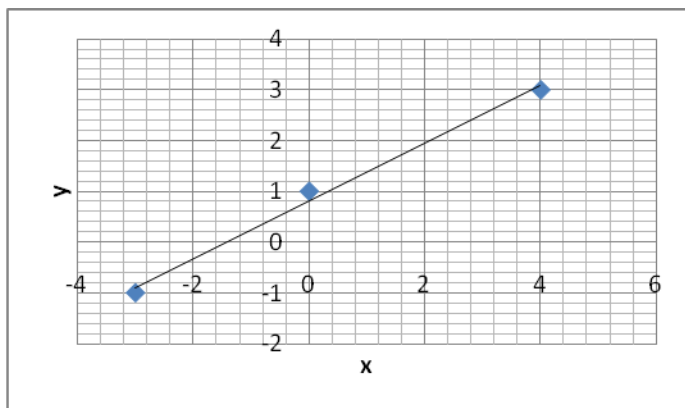
16.

D. $y = 1x + 0$

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B. y= 3

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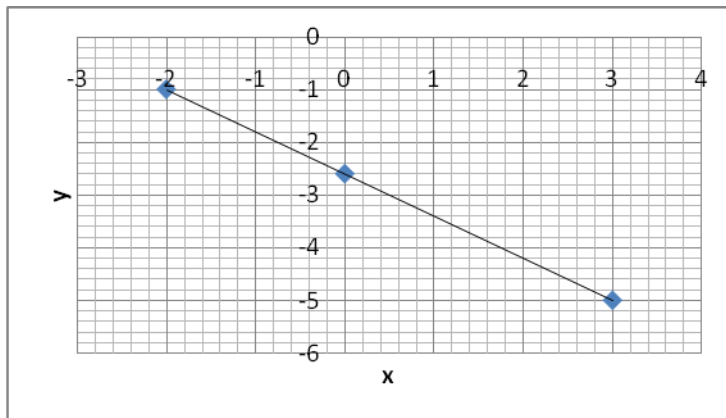
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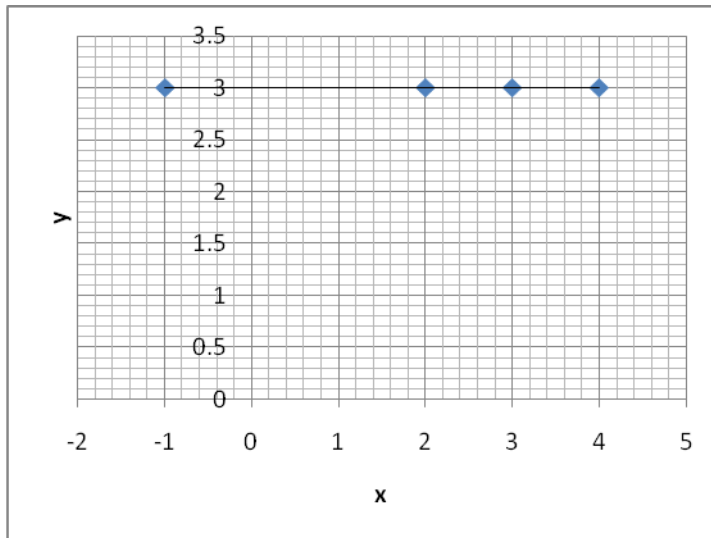
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<u>**Word Bank**</u>

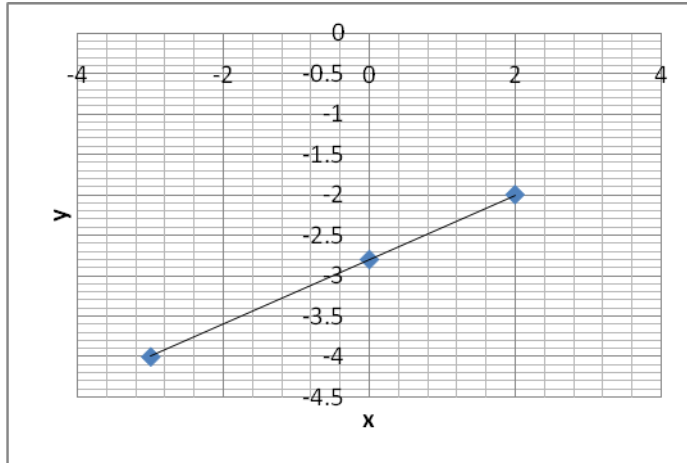A. y= $-\frac{4}{5}$x-2.6

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c. y$=-\frac{3}{2}x + 8$

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Sure: _____ Unsure: _____

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c. 3

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