**Math 1111 Journal Entries** **Name _____**
**Unit II (Chapter 2, Sections 2.1-2.4)**

Respond to each item, giving sufficient detail. You may neatly handwrite your responses. *This should be very helpful to you as you prepare for exams.*

1. Show the general formulas for calculating the distance and midpoint for the two points given by $(x_1, y_1)$ and $(x_2, y_2)$, along with an example for each.

General **Distance** formula: d = _____

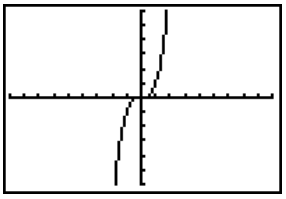
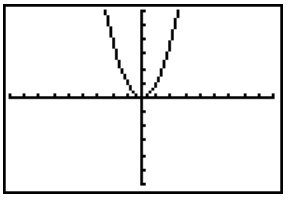
Specific Points: (2, 5) and (0, -1)

Distance apart: d =

General **Midpoint** formula: M = (_____ , _____)

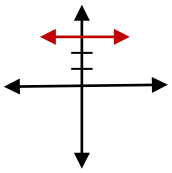
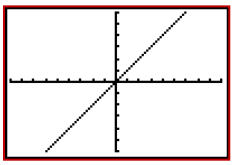
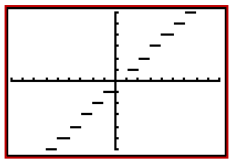
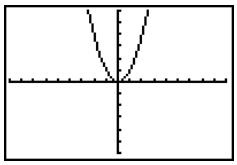
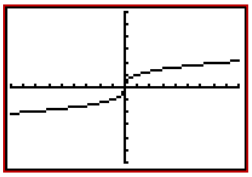
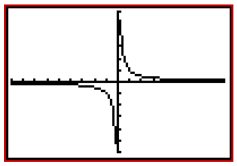
Midpoint: M =

2. Consider **symmetry** with respect to the x-axis, the y-axis, and the origin, giving the algebraic test along with the corresponding graph to illustrate each type of symmetry.

| | (a) | (b) | (c) |
|---|---|---|---|
| **Graph Example** |  | |  |
| **Type of symmetry** | | x-axis | y-axis |
| **Algebraic "test"** | Substitute -x for x & -y for y and check for equivalence with the original equation | Substitute -y for y and check for equivalence with the original equation | |

Refer to your graphs above. Which (a, b, and/or c) pass the vertical line test? _____

3. Consider the following rough sketches of the following 9 basic functions/types of functions. Please refer to Section 3.4 in our textbook for this "**Library of Functions**". Complete this table with either the missing formula or the missing graph.

| | | |
|---|---|---|
| y = b | | y = \| x \| |
|  |  | |
| | | $y = \sqrt{x}$ |
|  |  | |
| $y = x^3$ | | |
| |  |  |

4. Write the 3 forms of **linear equations** along with the meanings of the constants in each formula.

Slope-intercept form: _____ m: slope b: _____

General form: _____ A, B, C are real numbers

Point-slope form: _____ Point: $(x_1, y_1)$ Slope: m

5. Describe the meaning of **slope** and how to find it given two points $(x_1, y_1)$ and $(x_2, y_2)$.

Meaning: _____

Formula: m = _____

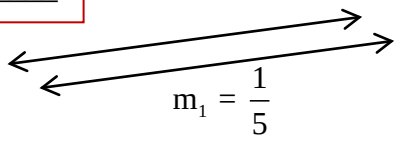
Also include the 4 general slope cases along with a drawing for each.

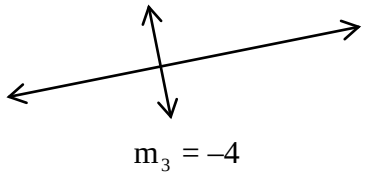
6. For **parallel lines**, the slopes are _____ , and the y-intercepts are different.

For **perpendicular lines**, the product of the slopes of the 2 lines is _____ .

On the diagrams below put a reasonable set of slope numbers on each line.

$m_2$ = _____

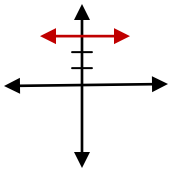



$m_4$ = _____

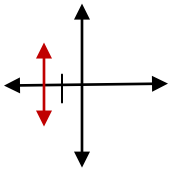
7. All **horizontal lines** have the form y = c, where c is a real number.

Write the equation of the given graph. _____



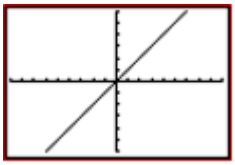
All **vertical lines** have the form _____ = c, where c is a real number.

Write the equation of the given graph. _____



Consider the **identity function**, y = x, and find its slope: m = _____ .

The x- and y-intercept is _____ .



8. There are countless **applications** involving linear functions. One involves the linear relationship between Celsius and Fahrenheit temperature measurements. A common formula (in slope-intercept form) is F = 1.8C + 32.

A table for this function would look like this.

| ˚C | 0 | 1 | 2 | 3 |
|---|---|---|---|---|
| ˚F | 32 | 33.8 | 35.6 | 37.4 |

(a) Another application involves uniform motion. Write the linear formula relating distance (d) and time (t) for a fixed rate of speed, r = 70 mph. d = _____

Complete the following table.

| t (hr) | 0 | 1 | 2 | 3 |
|---|---|---|---|---|
| d (mi) | 0 | | | |

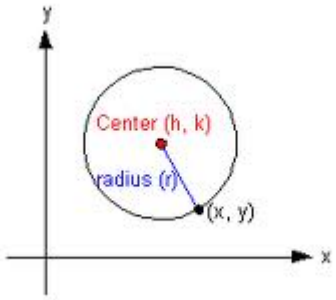
8. (b) Another common application involves cost structures. For example, an automobile mechanic may charge $245 for parts and $50 an hour for labor. Write the corresponding formula, with C for cost and t for time in hours.
C = _____

| t (hr) | 0 | 1 | 2 | 3 |
|---|---|---|---|---|
| C ($) | 245 | | | |

9. Write the 2 forms of the equation of a **circle** (standard and general). Use the constants h, k, and r in the standard form.

Standard form: _____ Center _____ ; radius r

General form: _____




True or False:

The **unit circle** has the equation $x^2 + y^2 = 1$. _____

The circle given by $(x-3)^2 + (y+2)^2 = 16$ has center (3, -2) and radius 8. _____

10. Write a few sentences describing something you learned that was new for you in class this unit. You may include a favorite activity, an interesting application, a teaching and learning technique, or a specific concept that you better understand as a result of this unit.

**Do your best! Rise to the challenge! Live and learn!**