Linear Equations, Graphs, and Applications

1. Change the linear equation $y - 2 = 3(x - 1)$ to

    (a) slope-intercept form   (b) general form

    (c) What is the slope of this line? _____

    (d) Give the ordered pair for any point on the line. _____

    (e) Give the intercepts.

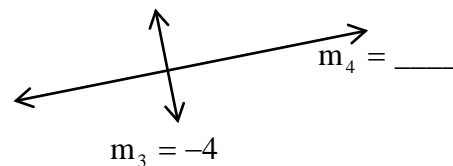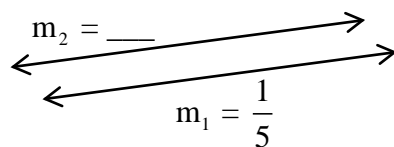   x-intercept: _____   y-intercept: _____

2. Complete the table for the following "special cases".

Equation	Slope	x-intercept	y-intercept
(a) $y = -4$			
(b) $x = 2$			
(c) $y = x$			

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

    For perpendicular lines, the slopes are _____ and _____ .

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

    $m_2 = \underline{\quad}$

    $m_1 = \dfrac{1}{5}$

    $m_4 = \underline{\quad}$

    $m_3 = -4$

4.	An **application** involving linear functions involves the relationship between Celsius and Fahrenheit temperature measurements. A common formula (in slope-intercept form) is _____ . Another application involves uniform motion.

Write the linear formula relating distance (d) and time (t) for a fixed rate of speed, r = 69 mph. _____

Another common application involves cost structures. For example, an automobile mechanic may charge $138 for parts and $60 an hour for labor. Write the corresponding formula, with C for cost and t for time in hours. _____

5.	Determine whether the given function is linear or nonlinear. If it is linear, determine the slope.

_____   _____

x	y
–3	12
0	14
3	16
6	18

6.	Graph the line with slope $-\dfrac{1}{4}$ that passes through the point given by (-4, 8).

Then find its equation in slope-intercept form.
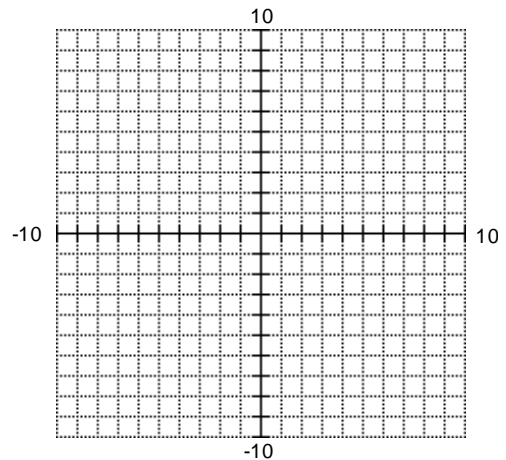
7.	For the graph of y = -3x + 6, find the intercepts. Use ordered pairs.

x-intercept _____   y-intercept _____

8.   For the line given by the equation x – 2y = 10, find the

slope _____   x-intercept _____   y-intercept _____

9.   Chelsea earns $350 per week plus 2.5% of her weekly sales. For a full week of hard (but satisfying!) work, she earned a total of $712.50. What were her sales for the week? [Use the given linear function to solve this application. Let x = her weekly sales and let y = her total salary.]

$$y = 350 + 0.025 \cdot x$$

10.   Find the equation of the line (in slope-intercept form)

(a) Vertical and containing the point (-3, -5)

(b) Horizontal and containing the point (-3, -5)

(c) Perpendicular to y = 3x – 5 and passing through the point given by (2, 6).

(d) Passing through the points (1, 5) and (-2, -1)

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