MAT 099
3.2 – 3.7

4 pts each
32 possible

Quiz 3

Name KEY

1. Let $f(x) = 3x^2 - 5x + 1$. Evaluate and simplify the following.

   a. $f(-2)$

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

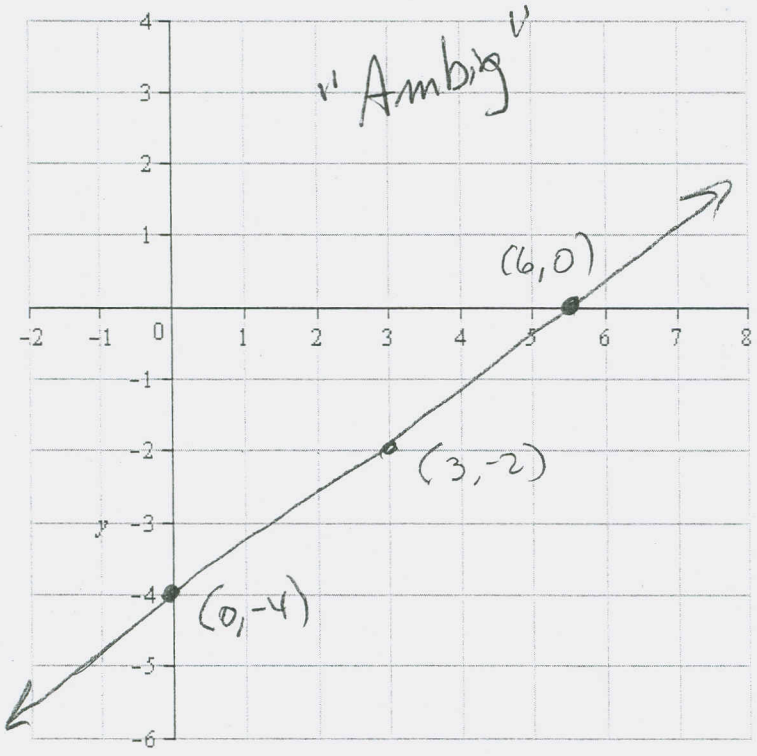
   $= 3(4) + 10 + 1 = \boxed{23}$

   b. $f(x-5)$ $= 3(x-5)^2 - 5(x-5) + 1$

   $= 3(x^2 - 10x + 25) - 5x + 25 + 1$

   $= 3x^2 - 30x + 75 - 5x + 26 = \boxed{3x^2 - 35x + 101}$

2. Sketch the graph of $f(x) = \frac{2}{3}x - 4$. Include any $x$- or $y$- intercepts, and if the intercepts are *all* you label on your graph, that's just fine with me! BETTER than fine!




If I don't see work on quizzes/tests, you won't earn the points.

$f(x) = 0$

$\frac{2}{3}x - 4 = 0$

$\frac{2}{3}x = 4$

$x = (4)\left(\frac{3}{2}\right) = 6$

$x = 6 \rightarrow (6, 0)$

Not a very good free-hand line! But the idea is there.

3. Find an equation of the line through (2, 1) and (-3, 2), using the Point-Slope Method.

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{2-1}{-3-2} = \frac{1}{-5}$

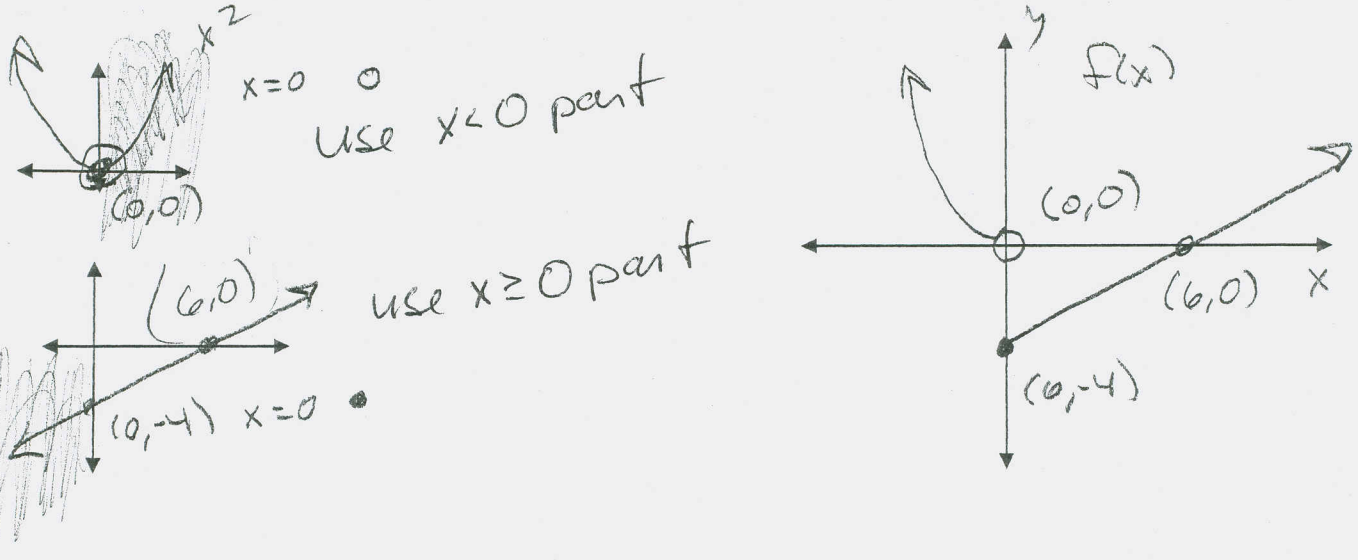
$\boxed{y = -\frac{1}{5}(x-2) + 1}$

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

4. What is the slope of any line that is parallel to the line $f(x) = \frac{2}{3}x - 4$? $\boxed{m = \frac{2}{3}}$

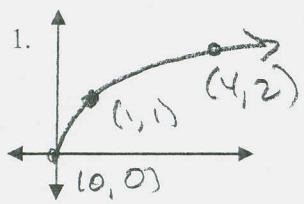
5. What is the slope of any line that is *perpendicular* to the line $f(x) = \frac{2}{3}x - 4$? $\boxed{m_{\perp} = -\frac{3}{2}}$

6. Graph the piecewise-defined function $f(x) = \begin{cases} x^2 & \text{if } x < 0 \\ \frac{2}{3}x - 4 & \text{if } x \geq 0 \end{cases}$. Include any intercepts and the suture point. **Hint:** You were asked to graph one of the pieces on the previous page!



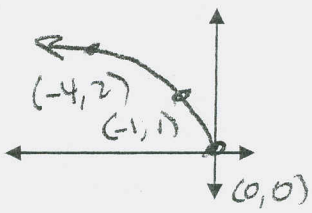

7. Sketch the graph of $g(x) = -\sqrt{3-x} - 5$, by transforming (reflecting and shifting) the graph of $f(x) = \sqrt{x}$. Show 3 points in the graph of $f$ and where they move to, in each sketch.

1.



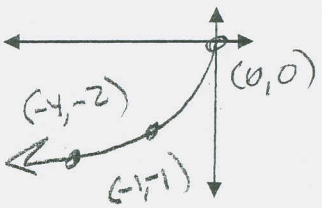

$f(x) = \sqrt{x}$

2.



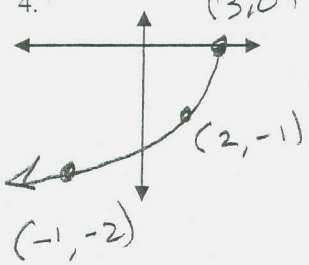

$f(-x) = \sqrt{-x}$

3.




$-f(-x) = -\sqrt{-x}$

4.




One move for each sketch.

$-f(-(x-3)) = -\sqrt{-(x-3)}$

5. $-f(-(x-3)) - 5$

$= -\sqrt{-(x-3)} - 5$

$= g(x)$