

Quiz # 1 Solutions!

By: College Football Saturday

November 4, 2009

Hi kids, it's almost Saturday, and that means that it's almost time to watch a full day of College Football!!!! First things first, though, here are the solutions to the first quiz. Enjoy! ROCK ON!

- (a) Here, $f(4) = (4)^2 - 3(4) + 2 = 6$.

(b) All of the x intercepts are where the graph touches the x -axis, or equivalently, when $f(x) = 0$. One may use the quadratic formula or factoring that this happens only when $x = 1$, and 2.

(c) The y -intercept of a function is where the graph touches the y -axis, or equivalently, when $x = 0$. So, $f(0) = 2$ is the only y intercept.

(d) Notice $f(-x) = (-x)^2 - 3(-x) + 2 = x^2 + 3x + 2$, which is not equal to $f(x)$ or $-f(x)$, hence, the function is neither even nor odd.
- (a) The graph is shifted one unit to the right.

(b) The graph is shifted 7 units down.

(c) The graph is first scaled by a factor of 3 vertically, then shifted up one unit.

(d) The graph is reflected over the x -axis and the y -axis.
- We complete the square on the x terms as follows:

$$x^2 - 4x = x^2 - 4x + 4 - 4 = (x - 2)^2 - 4.$$

Completing the square on the y terms gives us:

$$y^2 - 6y = y^2 - 6y + 9 - 9 = (y - 3)^2 - 9.$$

So we have

$$12 = x^2 - 4x + y^2 - 6y = (x - 2)^2 - 4 + (y - 3)^2 - 9,$$

And so adding 4 and 9 to the left side gives

$$25 = (x - 2)^2 + (y - 3)^2,$$

so the center of this circle is located at $(2, 3)$ and has radius $\sqrt{25} = 5$.

- Since 2 is the slope of the line $y = 2x - 1$, the slope of the line we're looking for is the negative reciprocal of 2, which is $-1/2$. Using point-slope form of a line, we have

$$y - 2 = -\frac{1}{2}(x - 1).$$