

Name: _____

Math 32, Spring 2010, Section 101
Quiz 2 Solutions

(1) Find equations for the following lines (2 pts each).
Write your answers in $y = mx + b$ form.

(a) The line passing through the points $(4, 8)$ and $(-3, -6)$.

The slope of the line is $\Delta y / \Delta x = (-6 - 8) / (-3 - 4) = -14 / -7 = 2$. So our line is of the form $y = 2x + b$. Plugging in $x = 4, y = 8$ gives $8 = 2 * 4 + b$, which gives $b = 0$. Hence the answer is $y = 2x$.

(b) The line that is parallel to $y = -x - 3$ and passes through the point $(0, 4)$.

Since our line is parallel to $y = -x - 3$, it has slope -1 . So the line is of the form $y = -x + b$. Plugging in $(0, 4)$ gives $4 = -0 + b$, or $b = 4$. So our line is $y = -x + 4$. Another way of looking at it is to notice that the point $(0, 4)$ tells us that the y -intercept of the line is 4 (by definition). Thus we can immediately conclude that $b = 4$.

(2) Determine all real solutions to the following equation. Remember to check for extraneous solutions, if appropriate. (3 points)

$$x^4 - 3x^2 = -2.$$

We make the substitution $t = x^2$ to get the quadratic $t^2 - 3t + 2 = 0$. Factoring gives $(t - 1)(t - 2) = 0$, which has solutions $t = 1$ and $t = 2$. Reversing the substitution gives $x^2 = 1$ and $x^2 = 2$, which have solutions $x = \pm 1, \pm \sqrt{2}$.

(3) The center of a circle is the point $(3, 2)$. If the point $(-2, -10)$ is on this circle, find the standard equation of this circle.

The radius of a circle is the distance between the center and a point on the circle. In this case, r is the distance between $(3, 2)$ and $(-2, -10)$. So we have

$$r = \sqrt{(3 - (-2))^2 + (2 - (-10))^2} = \sqrt{169} = 13.$$

Thus the equation of the circle in standard form is $(x - 3)^2 + (y - 2)^2 = 13^2 = 169$. Note: we could have actually just calculated r^2 from the beginning. That is, $r^2 = (3 - (-2))^2 + (2 - (-10))^2 = 169$, which is all we needed.