

Name: _____

Math 32, Spring 2010, Section 101
Quiz 1 Solutions

(1) Evaluate and/or simplify the following expressions. (1 pt each)

(a) $|1| - |-1| = 1 - 1 = 0$

(b) $|\sqrt{5} - \sqrt{7}|$

Since $\sqrt{5} < \sqrt{7}$, we have that $\sqrt{5} - \sqrt{7}$ is negative and $|\sqrt{5} - \sqrt{7}| = -(\sqrt{5} - \sqrt{7}) = \sqrt{7} - \sqrt{5}$.

(c) $|x - 3| + 2$ given that $x < 3$.

Since $x < 3$, we have that $x - 3$ is negative, so $|x - 3| = 3 - x$. Hence

$$|x - 3| + 2 = 3 - x + 2 = 5 - x.$$

(2) Rewrite the following statement using absolute value notation (1pt).

“The distance between y and the origin is more than 2.”

$$|y| > 2.$$

(3) Find all solutions to the following equations. You must show your work to receive full credit. (2pts each)

(a) $(x + 2)(x + 1) = x^2 + 11$

Multiplying out gives $x^2 + 3x + 2 = x^2 + 11$. Subtracting $x^2 + 2$ from both sides gives $3x = 9$ or $x = 3$.

(b) $x^2 - 5x = -6$

This is equivalent to $x^2 - 5x + 6 = 0$, or $(x - 3)(x - 2) = 0$. This has solutions $x = 2$ and $x = 3$.

(c) $\frac{1}{x} = \frac{4}{x} - 1$

Multiplying through by x gives $1 = (\frac{4}{x} - 1)x = 4 - x$. Adding x to both sides gives $x + 1 = 4$ or $x = 3$. Since we multiplied both sides by an expression containing the variable (just x in this case), we need to make sure our solution isn't extraneous. Plugging in we see that $\frac{1}{3} = \frac{4}{3} - 1$, so our solution $x = 3$ is valid.