

MAT 104 Quiz 5  
Friday, September 17, 2004

1. Solve the following inequality:

$$|x - 4| < 3$$

$$\begin{aligned} |x - 4| < 3 &\iff -3 < x - 4 < 3 \\ &\iff 1 < x < 7 \end{aligned}$$

$$\{x \mid 1 < x < 7\}$$

2. Solve the following inequality:

$$|2x + 3| \geq 3$$

$$\begin{aligned} |2x + 3| \geq 3 &\iff 2x + 3 \geq 3 \text{ or } 2x + 3 \leq -3 \\ &\iff 2x \geq 0 \text{ or } 2x \leq -6 \\ &\iff x \geq 0 \text{ or } x \leq -3 \end{aligned}$$

$$\{x \mid x \geq 0 \text{ or } x \leq -3\}$$

3. Solve the following equation:

$$|3x| = |x + 2|$$

$$\begin{aligned} |3x| = |x + 2| &\iff 3x = x + 2 \text{ or } 3x = -(x + 2) \\ &\iff 2x = 2 \text{ or } 3x = -x - 2 \\ &\iff x = 1 \text{ or } 4x = -2 \\ &\iff x = 1 \text{ or } x = -\frac{1}{2} \end{aligned}$$

$$\left\{1, -\frac{1}{2}\right\}$$