

## Quiz 1

Name: Key

Math 115, Fall 2016

Thursday Discussion Time: \_\_\_\_\_

**Directions:** You have 20 minutes to complete this quiz. Read each problem carefully. There are three problems on the reverse side. No calculators are allowed.

1. (1 point) Solve the following equation.

$$\frac{3x+1}{2} - \frac{2x}{3} = \frac{3}{2} \quad \text{LCD} = 6$$

$$6 \left( \frac{3x+1}{2} - \frac{2x}{3} \right) = 6 \left( \frac{3}{2} \right) \Rightarrow 3(3x+1) - 2(2x) = 3(3)$$

$$\Rightarrow 9x+3-4x=9 \Rightarrow 5x=6 \Rightarrow \boxed{x = \frac{6}{5}}$$

2. (2 points) Solve the following quadratic equation by factoring.

$$5x^2 - 7x - 6 = 0$$

$$(5x+3)(x-2) = 0$$

$$5x+3=0 \Rightarrow 5x=-3 \Rightarrow x = -\frac{3}{5}$$

$$x-2=0 \Rightarrow x=2$$

$$\boxed{x = -\frac{3}{5} \text{ or } x=2}$$

3. (2 points) Solve the following quadratic equation using the quadratic formula.

$$x^2 + x - 5 = 0 \quad a=1, b=1, c=-5$$

$$x = \frac{-1 \pm \sqrt{(1)^2 - 4(1)(-5)}}{2(1)} = \frac{-1 \pm \sqrt{21}}{2}$$

$$\boxed{x = \frac{-1 \pm \sqrt{21}}{2}}$$

4. (2 points) Find the discriminant of the following quadratic equation. Then state how many real solutions the equation has.

$$x^2 + 2x = -3$$

$$x^2 + 2x + 3 = 0 \quad a=1, b=2, c=3$$

$$d = b^2 - 4ac = (2)^2 - 4(1)(3) = 4 - 12 = \boxed{-8}$$

The equation has no real solutions.

5. (1 point) Solve the following inequality. Express your answer in interval notation.

$$4x - 5 > 3$$

$$4x > 8 \Rightarrow x > 2$$

interval:  $\boxed{(2, \infty)}$

6. (2 points) Solve the following compound inequality. Express your answer in interval notation.

$$1 \leq \frac{2x-1}{3} \leq 4$$

$$3(1) \leq 3 \left( \frac{2x-1}{3} \right) \leq 3(4) \Rightarrow 3 \leq 2x-1 \leq 12 \Rightarrow 4 \leq 2x \leq 13$$

$$\Rightarrow 2 \leq x \leq \frac{13}{2}$$

interval:  $\boxed{\left[2, \frac{13}{2}\right]}$