College Algebra

Test 1

Form A

Spring 2016

Name: _____

Date: _____

READ THESE INSTRUCTIONS CAREFULLY!

- Circle or underline your final written answer.
- Justify your reasoning and show your work.
- If you run out of space, make a note and continue your work on the back of a page.

Algebra Facts

Quadratic Formula

If a, b, and c are real numbers and $a \neq 0$, then the solutions of the equation $ax^2 + bx + c = 0$ are

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}.$$

Absolute Value

- If $|E| = F$, then either $E = F$ or $E = -F$.
- If $|E| \leq F$, then both $E \leq F$ and $E \geq -F$.
- If $|E| \geq F$, then either $E \geq F$ or $E \leq -F$.

Geometry Formulas

Given points (x_1, y_1) and (x_2, y_2), the distance between them is

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2},$$

their midpoint is

$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right),$$

and the slope between them is

$$\frac{y_2 - y_1}{x_2 - x_1}.$$

Circles

The circle having center (h, k) and radius r is given by the equation

$$(x - h)^2 + (y - k)^2 = r^2$$

Lines

The **standard form** equation of a line looks like

$$ax + by + c = 0,$$

where a, b, and c are constants. The **slope-intercept form** is

$$y = mx + b,$$

where m is the slope of the line and b the y-intercept. The **point-slope form** is

$$y - y_0 = m(x - x_0),$$

where m is the slope and (x_0, y_0) is any point on the line.

1. (10 pts.) Find all solutions of the following equation.

$$|4x - 3| + 10 = 19$$

2. (10 pts.) Find all solutions of the following equation.

$$\frac{x}{x+3} + 4 = \frac{2}{x+3}$$

3. (10 pts.) Find an equation for the line passing through the point $(7, 7)$ and having slope $2/5$.

4. (10 pts.) Find the distance between the points $(-2, 4)$ and $(-3, 5)$.

5. (10 pts.) Find the midpoint of the points $(4, 7)$ and $(-4, -2)$.

6. (10 pts.) Find an equation for the circle centered at $(7, -2)$ and having radius 2.

7. (10 pts.) Convert the standard form linear equation

$$6y + 2x = -2$$

to slope-intercept form.

8. (10 pts.) Find an equation in slope-intercept form for the line passing through the point $(2, 2)$ and parallel to $y = \frac{1}{2}x + 2$.

9. (10 pts.) Find all solutions of the following equation.

$$x^2 - 8x + 15 = 0$$

10. (10 pts.) Find all solutions of the following equation.

$$x^3 + 3x^2 - 18x = 0$$

Bonus. Find all solutions of the following equation.

$$2x^4 - 9x^2 + 10 = 0$$