Name: _____

Write all of your responses on these exam pages. If you need extra space please use the backs of the pages. Show all your work, answers without supporting justification will not receive credit. Each exercise is worth 10 points. Keep your answers in exact form. **No calculation devices allowed.**

1. Solve the following equation, find all solutions both real and complex.

$$2x^2 + 12x - 12 = 0$$

2. Solve the following equation, find all solutions both real and complex.

$$x^4 - 3x^2 - 10 = 0$$

3. Solve the following equation.

$$\sqrt{3x+1} - \sqrt{x+4} = 1$$

4. Solve the equation by completing the square. State all solutions, both real and complex.

$$3x^2 - 12x + 3 = 0$$

5. Solve the following inequality, and express the solution in terms of intervals.

$$(3x - 1)(10x + 4) \geq (6x - 5)(5x - 7)$$

6. Solve the following inequality and express the solution in terms of intervals.

$$|4x + 7| > 21$$

7. Solve the following for h.

$$c = \sqrt{4h(2R - h)}$$

8. Express in the form $a + bi$, where a and b are real numbers.

$$\frac{2 - 5i}{7 + i}$$

9. Find an equation of the circle that has endpoints of a diameter $A = (8, 10)$ and $B = (0, 4)$.

10. Find the equation of a line in slope-intercept form that passes through the point $A = (4, 5)$ and is perpendicular to the line $4x + 10y = 3$.