

## MATH 111 WORKSHEET 6

Show all work for full credit.

1. Solve each of the following equations by factoring.

a.  $x^3 + 3x^2 - x - 3 = 0$

b.  $4x^2 - 6x - 10 = x^2 - 9x + 8$

2. Solve the following by extracting square roots. Simplify.

a.  $(x + 13)^2 = 25$

3. Use the Quadratic Formula to solve. Simplify.

a.  $x^2 + 14x + 44 = 0$

b.  $25x^2 - 20x + 3 = 0$

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4. Solve the following by completing the square.

$$x^2 + 8x + 14 = 0$$

5. Use the method of completing the square to find the vertex form for the equation of the parabola.

$$f(x) = 2x^2 + 8x + 7$$

6. Write the vertex form of the equation of the parabola whose vertex is  $(5, 12)$  and that passes through the point  $(7, 15)$ .

7. **Without using a calculator:** Identify the vertex, axis of symmetry,  $x$ -intercepts, and maximum or minimum of the following parabola. Label your answers.

$$f(x) = \frac{1}{4}x^2 - 2x - 12$$