Name: **Academy 1 Classwork 3**

3-A Graphing Quadratic Equations

1. Write in standard form.

a) $5x^2 - 8 = 2x + 1$ b) $y = -3(2x + 9)^2 + 4$

2. Sketch each parabola, label the vertex and axis of symmetry, and state the maximum or minimum value.

a) $a(x) = -2(x - 3)^2 + 4$ b) $b(x) = x^2 + -6x + 4$ c) $c(x) = -0.3(x + 1)(x - 5)$

3-B Simplifying Radical Expressions

3. Simplify.

a) $\sqrt{x^{24}}$ b) $\sqrt{x^{25}}$ c) $\sqrt[3]{x^{25}}$ d) $\sqrt{50}$

e) $\sqrt{4068}$ f) $\sqrt{50x^{25}}$ g) $\sqrt{50x^{25}yz^{16}}$ h) $\sqrt[3]{54x^6yz^{302}}$

4. Rationalize the denominators, and simplify.

a) $\frac{1}{\sqrt{2}}$ b) $\frac{10}{\sqrt{2}}$ c) $\frac{7}{5 - \sqrt{3}}$ d) $\frac{6}{4 + \sqrt{2}}$

3-C Complex Numbers

5. Solve.

a) $x^2 = 100$ b) $x^2 = -100$ c) $4x^2 = -100$ d) $4x^2 + 36 = 0$

6. Evaluate.

a) $2(3 + 4i) - (11 - i)$ b) $(1 + 2i)(1 - 2i)$ c) $(1 + 2i)(1 + 2i)$ d) $\frac{6 + 8i}{3 + i}$

3-D Factoring

7. Factor completely.

a) $x^2 + 11 + 30$ b) $x^2 - x + 30$ c) $16x - 36$ d) $4x^2 + 12x + 9$

e) $3x^6 + 36x^5 + 105x^4$ f) $15x^5 + 24x^3 + 10x^2 + 16$ g) $12x^2 + 35x + 8$ h) $27x^3 - y^{12}$

3-E Solving Quadratics

8. Let $f(x) = x^2 + 12x + 27$. Find the zeros of f using each of the following methods.

a) by factoring b) by completing the square c) by using the quadratic formula

9. Solve using any method. Circle any answers that are imaginary.

a) $x^2 + 20x = -96$ b) $x^2 + 20x = -104$ c) $45x^2 + 16x = 5$ d) $2x^2 + 4x + 10 = 0$

10. Use your answers from #9 to identify the x-intercepts (if any) of the following parabolas.

a) $y = x^2 + 20x + 96$ b) $y = x^2 + 20x + 104$ c) $y = 45x^2 + 16x - 5$ d) $y = 2x^2 + 4x + 10$