ALGEBRA 2 Exam03 Review II   Key   Name _____ ③
                                                 Period _____

1. Find the zeros of each function.

a.   b. $f(x) = x^2 - 10x + 21$ c. $f(x) = 3x^2 - 27$

$(X-7)(X-3) = 0$ $3(X^2 - 9)$

$X = 7 \quad X = 3$ $3(X-3)(X+3)$
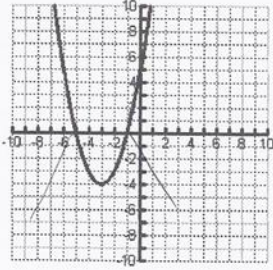
                                        $X = 3 \quad X = -3$

a. __~5__ , __-1__   b. __7__ , __3__   c. __3__ , __-3__

2. Find the roots of each equation <u>using factoring</u>.

   a. $x^2 - 3x - 4 = 0$ b. $8x = 21 - 5x^2$

   $(X-4)(X+1) = 0$ $5x^2 - 8x - 21 = 0$

   $\boxed{X = 4 \quad X = -1}$ $(X-3)(5X+7) = 0$

                                             $X - 3 = 0 \qquad 5X + 7 = 0$

3. Solve by completing the square: $\boxed{X = 3} \qquad 5X = -7$

                          $x^2 + 8x + 16 = \frac{21}{2}$ $\boxed{X = -7/5}$

   a. $2x^2 + 16x = -11$ $(x+4)^2 = \frac{21}{2}$ b. $x^2 - 10x - 3 = 0$

   $\frac{2}{2} \quad \frac{2}{2} \quad \frac{2}{2}$ $X^2 - 10X = 3$

   $X^2 + 8X = \frac{-11}{2}$ $X + 4 = \pm\sqrt{\frac{21}{2}}$ $X^2 - 10X + \left(\frac{-10}{2}\right)^2 = 3 + \left(\frac{-10}{2}\right)^2$

   $X^2 + 8X + \left(\frac{8}{2}\right)^2 = \frac{-11}{2} + \left(\frac{8}{2}\right)^2$ $X = -4 \pm \sqrt{\frac{21}{2}} = \boxed{\frac{-4 \pm \sqrt{42}}{2}}$ $X^2 - 10X + 25 = 28$

                                                                 $(X-5)^2 = 28$

4.   Write the equation in vertex form, and identify its vertex. $X - 5 = \pm\sqrt{28}$

                                                                 $X = 5 \pm \sqrt{28}$

   $y = x^2 + 6x - 2$ $\boxed{X = 5 \pm 2\sqrt{7}}$

   $h = -\frac{b}{2a} = \frac{-6}{2(1)} = -3$ Vertex Form   __$(X+3)^2 - 11$__

   $f(-3) = X^2 + 6X - 2$ Vertex   __$(-3, -11)$__

   $(-3)^2 + 6(-3) - 2$

   $9 - 18 - 2$

   $9 - 20 = -11$

5. A rocket is launched from ground level with an initial velocity of 112 ft/s. After how many seconds will the rocket hit the ground? Use $h(t) = -16t^2 + v_0 t + h_0$.

Write the equation used to solve this problem. $\underline{\quad 0 = -16t^2 + 112t + 0 \quad}$

Find the number of seconds after the rocket is launched that it will hit the ground. $\underline{\quad 7\,sec \quad}$

$$-16t(t-7) = 0 \qquad t-7 = 0 \qquad t = 7$$

6. Write the equation in vertex form, and identify its vertex.

$y = x^2 - 12x - 7$

$$h = -\frac{b}{2a} = \frac{-(-12)}{2(1)} = \frac{12}{2} = 6$$

$x^2 - 12x - 7$

$6^2 - 12(6) - 7 = 43$

Vertex Form $\underline{\quad (x-6)^2 - 43 \quad}$

Vertex $\underline{\quad (6, -43) \quad}$

7. Solve by using the <u>square root property</u> (extracting the square root).

$3x^2 - 5 = 55$

$$3x^2 = 60$$
$$x^2 = 20$$

$x = \pm\sqrt{20}$

$\boxed{x = \pm 2\sqrt{5}}$

$\underline{\quad 2\sqrt{5} \quad}$, $\underline{\quad -2\sqrt{5} \quad}$

8. Write an equation for finding the dimensions of a rectangle in the figure, then solve the equation and state the dimensions of the rectangle. Label your answers.
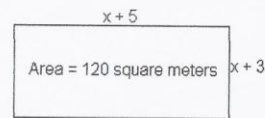
Equation $\underline{\quad 120 = (x+5)(x+3) \quad}$

$A = L \cdot w$

$120 = (x+5)(x+3) = x^2 + 8x + 15$

$x^2 + 8x - 105$

$(x+15)(x-7)$

$x + 15 = 0 \qquad x - 7 = 0$

$x = -15 \qquad x = 7$

Area = 120 square meters

x + 5

x + 3

$x + 5 \rightarrow 12$

$x + 3 \rightarrow 10$

Length $\underline{\quad 12\,m \quad}$ Width $\underline{\quad 10\,m \quad}$