Name_____

Intermediate Algebra: Practice Test Over Quadratic Equations

#1 Solve: $x^2 - 3x = 10$

#2 Solve: $x^2 + 81 = 0$

#3 Solve by completing the square: $x^2 - 10x + 18 = 0$

#4 Solve using the quadratic formula: $x^2 - 2x + 6 = 0$

#5 Solve: $6x^2 + 7x - 3 = 0$

#6 Solve: $3x^2 + 24 = -6x$

#7 Solve: $(3x - 1)^2 - 5(3x - 1) - 14 = 0$

#8 Solve: $-\frac{1}{3}x^2 + 1x + 6 = 0$

#9 Graph. Label all intercepts. $y = -2x^2 - 8x - 6$

#10 Solve the inequality: $-2x^2 - 8x < 6$

SOLUTIONS

#1 Solve: $x^2 - 3x = 10$

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

$(x + 2)(x - 5) = 0$

$x + 2 = 0,\ x - 5 = 0$

$x = -2,\ x = 5$

#2 Solve: $x^2 + 81 = 0$

$x^2 = -81$

$\sqrt{x^2} = \sqrt{-81}$

$x = \pm 9i$

#3 Solve by completing the square: $x^2 - 10x + 18 = 0$

$$x^2 - 10x + \left(\frac{10}{2}\right)^2 = -18 + \left(\frac{10}{2}\right)^2$$

$$(x-5)^2 = -18 + 25$$

$$(x-5)^2 = 7$$

$$\sqrt{(x-5)^2} = \sqrt{7}$$

$$x - 5 = \pm\sqrt{7}$$

$$x = 5 \pm \sqrt{7}$$

#4 Solve using the quadratic formula: $x^2 - 2x + 6 = 0$

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4 \cdot 1 \cdot 6}}{2 \cdot 1}$$

$$x = \frac{2 \pm \sqrt{4 - 24}}{2}$$

$$x = \frac{2 \pm \sqrt{-20}}{2}$$

$$x = \frac{2 \pm \sqrt{-1 \cdot 4 \cdot 5}}{2}$$

$$x = \frac{2 \pm 2i\sqrt{5}}{2}$$

$$x = 1 \pm i\sqrt{5}$$

#5 Solve: $6x^2 + 7x - 3 = 0$

$$x = \frac{-(7) \pm \sqrt{7^2 - 4 \cdot 6 \cdot -3}}{2 \cdot 6}$$

$$x = \frac{-7 \pm \sqrt{49 + 72}}{12}$$

$$x = \frac{-7 \pm \sqrt{121}}{12}$$

$$x = \frac{-7 + 11}{12}, x = \frac{-7 - 11}{12}$$

$$x = \frac{4}{12}, x = \frac{-18}{12}$$

$$x = \frac{1}{3}, x = -\frac{3}{2}$$

#6 Solve: $3x^2 + 24 = -6x$

$3x^2 + 6x + 24 = 0$

$3(x^2 + 2x + 8) = 0$

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

$$x = \frac{-2 \pm \sqrt{2^2 - 4 \cdot 1 \cdot 8}}{2 \cdot 1}$$

$$x = \frac{-2 \pm \sqrt{4 - 32}}{2}$$

$$x = \frac{-2 \pm \sqrt{-28}}{2}$$

$$x = \frac{-2 \pm \sqrt{-1 \cdot 4 \cdot 7}}{2}$$

$$x = \frac{-2 \pm 2i\sqrt{7}}{2}$$

$x = -1 \pm i\sqrt{7}$

#7 Solve: $(3x - 1)^2 - 5(3x - 1) - 14 = 0$

Let $(3x - 1) = a$

$a^2 - 5a - 14 = 0$

$(a + 2)(a - 7) = 0$

$a + 2 = 0, a - 7 = 0$

$a = -2, a = 7$

$3x - 1 = -2$ and $3x - 1 = 7$

$3x = -1$ $3x = 8$

$x = -1/3$ $x = 8/3$

#8 Solve: $\frac{1}{3}x^2 + 1x + 6 = 0$

$$3\left(\frac{1}{3}x^2 + 1x + 6 = 0\right)$$

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

$$x = \frac{-3 \pm \sqrt{3^2 - 4 \cdot 1 \cdot 18}}{2 \cdot 1}$$

$$x = \frac{-3 \pm \sqrt{9 - 72}}{2}$$

$$x = \frac{-3 \pm \sqrt{-63}}{2}$$

$$x = \frac{-3 \pm \sqrt{-1 \cdot 9 \cdot 7}}{2}$$

$$x = \frac{-3 \pm 3i\sqrt{7}}{2}$$

#9 Graph. Label all intercepts. $y = -2x^2 - 8x - 6$

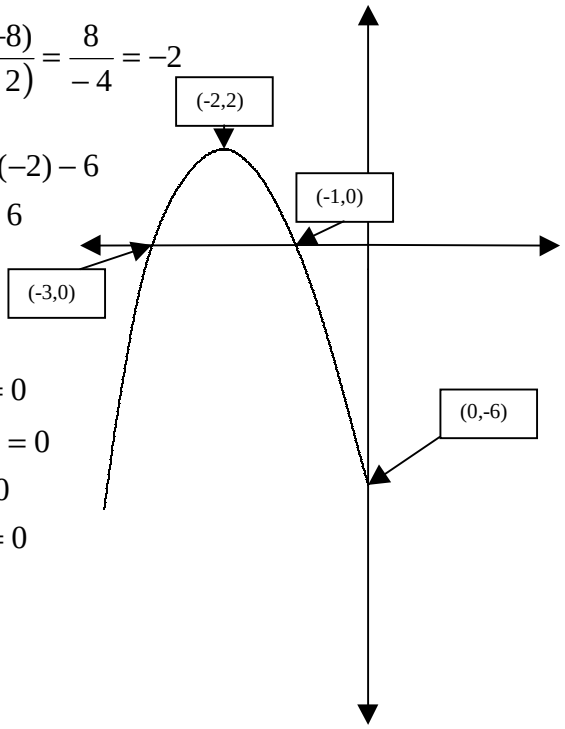
To find the *x*-value of the vertex: $h = \frac{-b}{2a} = \frac{-(-8)}{2(-2)} = \frac{8}{-4} = -2$

To find the *y*-value of the vertex:

$$k = -2(-2)^2 - 8(-2) - 6$$
$$k = -2(4) + 16 - 6$$
$$k = -8 + 16 - 6$$
$$k = 2$$

To find the *x*-intercepts:

$$-2x^2 - 8x - 6 = 0$$
$$-2(x^2 + 4x + 3) = 0$$
$$(x+1)(x+3) = 0$$
$$x + 1 = 0,\ x + 3 = 0$$
$$x = -1,\ x = -3$$



Vertex (*h*,*k*): (–2,2)
y-intercept (0,C): (0, –6)
x-intercepts: (–1,0),(–3,0)

#10 Solve the inequality: $-2x^2 - 8x < 6$

$$-2x^2 - 8x - 6 < 0$$

The quadratic is < zero where the above graph is below the x-axis: $(-\infty,-3) \cup (-1, \infty)$.