Pre-Calculus 11 Quadratic Equations

Quadratic Equations Review

A. Multiple Choice

1.) Identify which polynomial has $x + 5$ as a factor.

    a.) $x^2 + 3x - 54$ b.) $20x^2 + 3x - 2$ c.) $x^2 - 25y^2$ **(d.)** $3x^2 + 3x - 60$

2.) Identify the value of the discriminant of $4x^2 - 12x + 9 = 0$

    a.) 1   b.) $\dfrac{3}{2}$ c.) -132 **(d.)** 0

3.) Identify which equation has exactly one real root.

    (a.) $x^2 + 9 = 6x$ b.) $4x^2 - 8x + 5 = 0$

    c.) $3x^2 - 10x + 5 = 0$ d.) $8x^2 - x + 4 = 0$

4.) Consider the equation $x^2 - 6x + k = 0$. Identify the value(s) of k for which $x^2 - 6x + k = 0$ is this a perfect square trinomial.

    a.) 0   b.) ± 3 **(c.)** 9   d.) 6

5.) The roots, to the nearest hundredth, of $-\dfrac{1}{2}x^2 + x + \dfrac{7}{2} = 0$ are:

    a.) 1.83 and 3.83   **(b.)** -1.83 and 3.83   c.) 1.83 and -3.83   d.) 1.83 and -3.83

Part B: Short Answer

1.) State how many real roots a quadratic equation has if the discriminant is -19.

    no real roots

2.) Write a quadratic equation which has roots -2 and 3.

    $x^2 - x - 6 = 0$

3.) Solve: $(x+1)^2 = 3$

    $x = -1 \pm \sqrt{3}$

4.) Determine the discriminant of $x^2 - 2x = 0$ *4*

5.) Factor: $x^2 - 9$ *$(x - 3)(x + 3)$*

Part C: Long Answer

1.) Factor each polynomial expression.

    a.) $3x^2 + 28x + 9$ *$(3x + 1)(x + 9)$*

    b.) $(4x - 2)^2 - (2 + 4x)^2$ *$-32x$*

    c.) $2(5x - 3)^2 + 5(5x - 3) - 3$

                     $5x(10x - 7)$

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2.) Solve, by factoring.
   $4x^2 - 2x - 12 = 0$ $x = -\dfrac{3}{2}$ $x = 2$

3.) Solve by completing the square.
   $x^2 + 10x - 21 = 0$ $x = -5 \pm \sqrt{46}$

4.) Solve, using the quadratic formula.
   a.) $5x^2 - 7x - 1 = 0$ $x = \dfrac{7 \pm \sqrt{69}}{10}$
   b.) $2x^2 + 4x - 7 = 0$ $x = \dfrac{-2 \pm 3\sqrt{2}}{2}$

5.) Solve.
   $(x - 2)(x + 3) = 24$ $x = -6$ $x = 5$

6.) Determine the value of k such that the equation: $2x^2 + 5x + k = 0$ has one real root. $k = \dfrac{25}{8}$

7.) Two numbers have a sum of 9 and a product of 20. Determine the numbers. 4 ; 5

8.) The length of an outdoor lacrosse field is 10 m less than twice its width. The area of the field is 6600 m². Determine the dimensions of this field.

   $60\,m \times 110\,m$

Extra Practice: Review pg. 198
             Practice Test pg. 201