

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Pre-Calculus 11 Ch3/4 HW Lesson 9 Discriminant Nature of the Roots**  $D = b^2 - 4ac$ 

1. Determine the nature of the roots [ie: Determine how many x-intercepts each quadratic equation has]

a) $x^2 + 5x + 6 = 0$	b) $12x^2 + 7x - 3 = 0$	c) $-2x^2 - 7x + 5 = 0$
d) $4x^2 = 13x - 8$	e) $x(7 - 8x) = 10$	f) $x(x + 2) = 6 - (x - 3)(2x + 1)$

2. Solve each of the following inequalities:

a) $x^2 < 16$	b) $x^2 - 25 > 0$	c) $x(3 - x) < 0$
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3. Determine the value of "k" so that the equation has two equal roots:

a) $x^2 + kx + 25 = 0$	b) $kx^2 + 4x + 1 = 0$	c) $0.5x^2 + 3kx + (3k + 4) = 0$
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4. Determine the value of "k" so that the equation has two different roots:

a) $x^2 - kx + 12 = 0$	b) $kx^2 - kx + 1 = 0$	c) $x^2 - 4kx + (5k - 6) = 0$
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5. Determine the value of "k" so that the equation has no real roots:

a) $x^2 - kx - 24 = 0$	b) $lx^2 - kx + 8 = 0$	c) $x^2 - 3kx - (3k - 8) = 0$
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6. In order for a quadratic function to be factorable, what value must the discriminant be equal to? Explain:

7. If the quadratic equation  $(x-2)^2 + k = 0$  has two distinct real roots, then what is the range of "k"?

(Multiple choice, circle one) Justify your answer.

a)  $k > 2$

b)  $k < 0$

c)  $k \leq 0$

d)  $k \leq 4$