## Quadratic Equation Summary / Study Guide

### Pythagorean Theorem

<table>
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<th>Equation</th>
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<td>a^2 + b^2 = c^2</td>
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### Steps for Solving Quadratic Equations

1. Use the ________________ to determine the number and kinds of solutions.

2. If the discriminant is a positive perfect square or 0, then _____________________________

3. If the discriminant is a positive number that’s not a perfect square, then ________________
   ____________________________________________________________________________

4. If the discriminant is a negative number, then _____________________________________.

### When Factoring or Using the Quadratic Formula, always make sure that

the equation is in _____________________________ or set equal to 0.

### When Graphing Quadratic Equations

1. Find the x-intercepts by factoring if possible. (Use the discriminant to determine if you can factor)

2. Find the x coordinate of the vertex by using the formula: x = -b/2a.

3. Find the y coordinate of the vertex by substituting the x coordinate into the equation and solving for y.

4. Find the y-intercept by letting x = 0  or  Y = c. If possible, find it’s “mirror point”.

5. If you were not able to factor, find two other points equidistant from the vertex. Choose the x-coordinates and solve for the y-coordinate. (They should be “mirror points” as well)
Pythagorean Theorem

Can only be used to determine the sides of right triangles.

\[ A^2 + B^2 = C^2 \]

A and B are the legs of the right triangle and C is the hypotenuse of the right triangle.

Steps for Solving Quadratic Equations

1. Use the discriminant to determine the number and kinds of solutions.

2. If the discriminant is a positive perfect square or 0, then there are real integer solutions and you can factor the equation.

3. If the discriminant is a positive number that's not a perfect square, then the solutions are irrational and you must use the quadratic formula.

4. If the discriminant is a negative number, then there are no real solutions and you cannot factor or use the quadratic formula. The graph for this equation does not cross the x-axis.

When Factoring or Using the Quadratic Formula, always make sure that the equation is in standard form or set equal to 0.

When Graphing Quadratic Equations

1. Find the x-intercepts by factoring if possible. (Use the discriminant to determine if you can factor)

2. Find the x coordinate of the vertex by using the formula: \( x = \frac{-b}{2a} \).

3. Find the y coordinate of the vertex by substituting the x coordinate into the equation and solving for y.

4. Find the y-intercept by letting \( x = 0 \) or \( y = c \). If possible, find it’s “mirror point”.

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