

## Geometry    Concept Review for Solving by Factoring, Completing the Square, and Quadratic Formula

### I. Solving by Factoring method

1. Arrange terms in standard form :  $ax^2 + bx + c = 0$
2. Factor out GCF

\* If equation is missing a "b" value, then add in  $0x$  (example:  $4x^2 - 9 = 0$  becomes  $4x^2 + 0x - 9 = 0$  )

3. Find values where

$$\begin{array}{r} \underline{\quad} \times \underline{\quad} = a \times c \\ \underline{\quad} + \underline{\quad} = b \end{array}$$

4. Replace "b" term with values from above
5. Pair terms and factor out GCF for each pair
6. Put expression in factored form
7. Solve for each x.

### II. Solving by Completing the Square method

1. Arrange terms in standard form :  $ax^2 + bx + c = 0$
2. "a" value MUST be equal to 1, so divide each term by the GCF to make  $a = 1$
3. Move constant to the other side of the equation and add spaces to each side

$$\boxed{x^2 + bx + \underline{\quad} = c + \underline{\quad}}$$

4. Find  $\left(\frac{b}{2}\right)^2$  and enter this value into the blank spaces  $\underline{\quad}$  on both sides of the equation
5. Rewrite left side in factored form and add the numbers on the right side
6. take the  $\sqrt{\quad}$  of both sides (don't forget  $\pm$ )
7. solve for x

### III. Solving by Quadratic Formula method

1. Arrange terms in standard form :  $ax^2 + bx + c = 0$
2. Find the discriminant :  $b^2 - (4 \times a \times c)$

3. Plug into quadratic formula  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

4. Solve for x

### IV. The Discriminant

1. The discriminant describes the **nature** , or the type, of solutions
2. If the Discriminant is **positive (D > 0)** , there are 2 real answers (2 real roots)
3. If the Discriminant is **zero,(D = 0)** there is 1 real answer. (1 real root)
4. If the Discriminant is **negative (D < 0)** , there are 2 imaginary answers (2 imaginary roots)