Solving Quadratic Equations using Quadratic Formula

Given an equation in standard form, $y = ax^2 + bx + c$, you can solve for x using the quadratic equation.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Example: Solve $3x^2 - 5x = 2$

$3x^2 - 5x - 2 = 0$

$a = \quad b = \quad c =$

$\downarrow$

$x =$

$\downarrow$

$x =$

$\downarrow$

$x =$

$\downarrow$

$x =$

$\downarrow$

Find the solution(s) to each equation.

1) $6p^2 - 2p - 3 = 0$

2) $-2x^2 - x - 1 = 0$

3) $-4m^2 - 4m + 5 = 0$

4) $5b^2 + b - 2 = 0$

5) $r^2 + 5r + 2 = 0$

6) $2p^2 + 5p - 4 = 0$
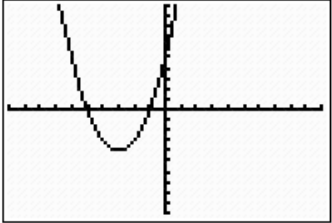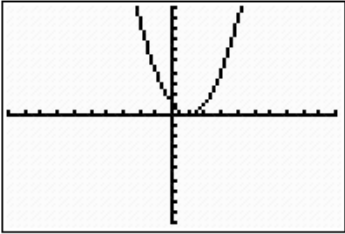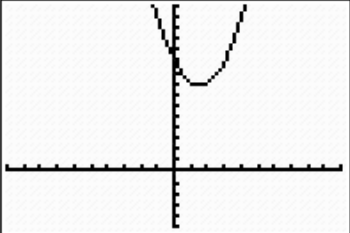
7) $9n^2 - 3n - 8 = -10$

8) $-2x^2 - 8x - 14 = -6$

9) $9m^2 + 6m + 6 = 5$

10) $4a^2 = 8a - 4$

Discriminant:
The discriminant can help us determine the type and number of solutions the function has.

$$Discriminant = b^2 - 4ac$$ **(comes from quadratic formula)**

Value of Discriminant	Type & Number of Solutions	Examples of Graph
$b^2 - 4ac > 0$	**Two Real Solutions**	 There are two x-intercepts.
$b^2 - 4ac = 0$	**One Real Solution**	 There is one x-intercept.
$b^2 - 4ac < 0$	**no real solutions**	 There are no x-intercepts.

Example:
Determine the number of solutions the function has.
$$y = x^2 + 6x + 8$$

Find the value of the discriminant. Then find the number and type of solutions for each equation.

1) $6p^2 - 2p - 3 = 0$

2) $-2x^2 - x - 1 = 0$

3) $-4m^2 - 4m + 5 = 0$

4) $5b^2 + b - 2 = 0$

5) $r^2 + 5r + 2 = 0$

6) $2p^2 + 5p - 4 = 0$

Find the solution(s) to each equation.

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