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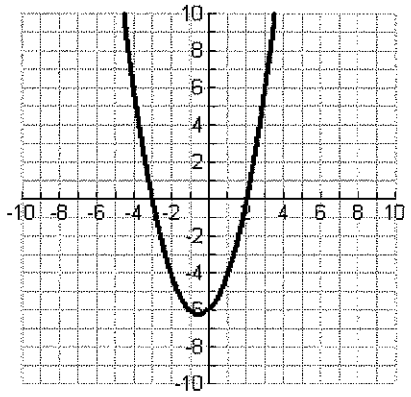
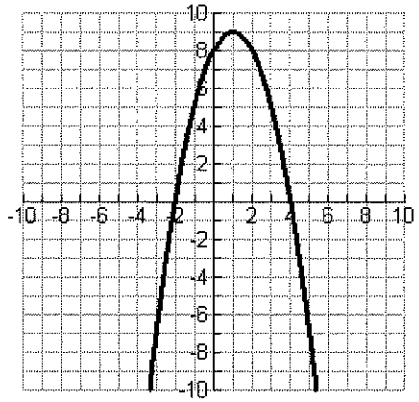
Homework: Exploring the Connection: Quadratic Formula and x-Intercepts

Graph	Function	Identify a, b, and c	Use the Quadratic Formula to solve for roots $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	Compare solutions to the x-intercepts of the graph
	$y = x^2 + x - 6$	$a = 1$ $b = 1$ $c = -6$	Use a, b, and c in the quadratic formula in the space below. $x = \frac{-1 \pm \sqrt{1^2 - 4(1)(-6)}}{2(1)}$ ① $\frac{-1+5}{2}$ ② $\frac{-1-5}{2}$ $x = 2$ $x = -3$	Compare answers to graph and x-intercepts. What do you notice? same
	$y = -x^2 + 2x + 8$	$a = -1$ $b = 2$ $c = 8$	$x = \frac{-2 \pm \sqrt{(2)^2 - 4(-1)(8)}}{2(-1)}$ ① $x = \frac{-2+6}{-2}$ ② $x = \frac{-2-6}{-2}$ ① $x = -2$ ② $x = 4$	same

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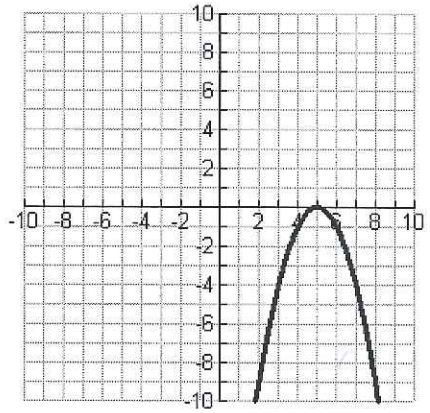
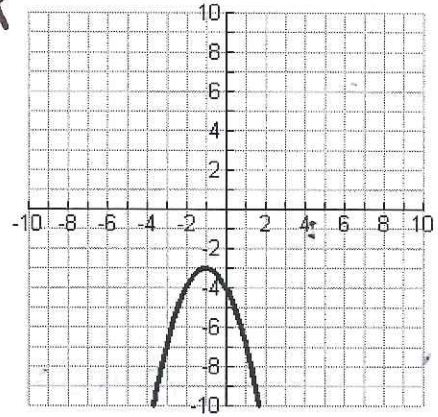
	$y = -x^2 + 10x - 25$	$a = -1$ $b = 10$ $c = -25$	$x = \frac{-10 \pm \sqrt{(10)^2 - 4(-1)(-25)}}{2(-1)}$ $x = \frac{-10 \pm \sqrt{0}}{-2}$ ① $\frac{-10}{-2} = 5$ $x = 5$	same
★ 	$y = -x^2 - 2x - 4$	$a = -1$ $b = -2$ $c = -4$	$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(-1)(-4)}}{2(-1)}$ $x = \frac{2 \pm \sqrt{-12}}{-2}$ no real solutions	same

The equation $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ is called the "quadratic formula". It is an algebraic way of finding x-intercepts and can be used whether the quadratic is factorable of not. The last two graphs did not have x-intercepts. Re-examine the 4th column in your table and explain how you can look at the quadratic formula after values have been substituted and know that there are no x-intercepts.