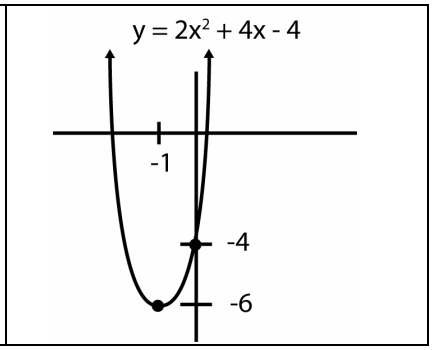
Quadratic functions practice Solutions **NAME:**

For questions 1 through 3, determine the function's orientation, *y*-intercept, and vertex (without graphing). Remember, a vertex has an *x* and a *y* value. Then provide a quick sketch of the parabola. Show your work and write your answers in the spaces provided. (You may check your graphs with your calculator.)

1. $y = 2x^2 + 4x - 4$

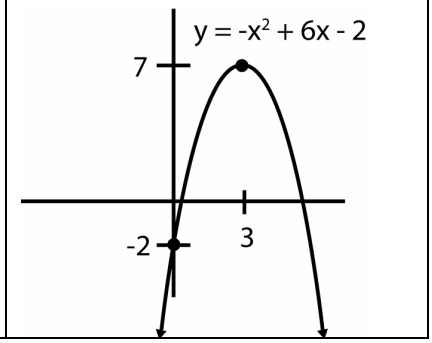
It opens up because the "a" coefficient, the 2, is positive. Its y-intercept is found when x is 0, which is y = -4. The x value of the vertex is $\frac{-b}{2a} = \frac{-4}{4} = -1$. *Put this into the equation for x to get the y value of the vertex, y = -6. Plot the y-intercept and vertex. Then, knowing that it opens up, draw a roughly symmetric parabola in.*



orientation___*UP*__ *y*-intercept___*(0,-4)* vertex__*(-1, -6)* sketch_____

2. $y = -x^2 + 6x - 2$

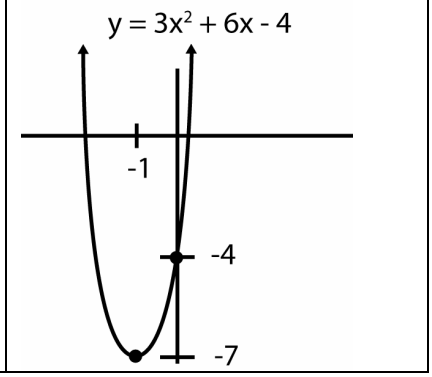
It opens down because the "a" coefficient, the -1, is negative. Its y-intercept is found when x is 0, which is y = -2. The x value of the vertex is $\frac{-b}{2a} = \frac{-6}{-2} = 3$. *Put this into the equation for x to get the y value of the vertex, y = 7. Plot the y-intercept and vertex. Then, knowing that it opens down, draw a roughly symmetric parabola in.*



orientation__*DOWN* *y*-intercept_*(0, -2)* vertex_*(3, 7)*_ sketch_____

3. $f(x) = 3x^2 + 6x - 4$

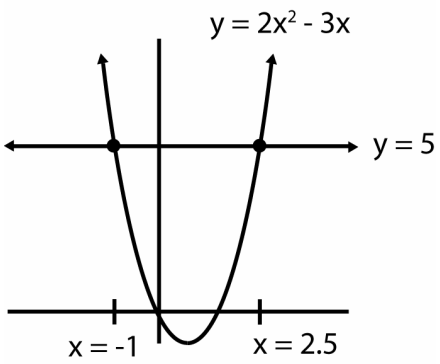
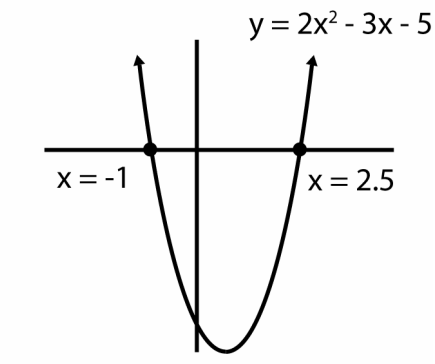
It opens up because the "a" coefficient, the 3, is positive. Its y-intercept is found when x is 0, which is y = -4. The x value of the vertex is $\frac{-b}{2a} = \frac{-6}{6} = -1$. *Put this into the equation for x to get the y value of the vertex, y = -7. Plot the y-intercept and vertex. Then, knowing that it opens up, draw a roughly symmetric parabola in.*



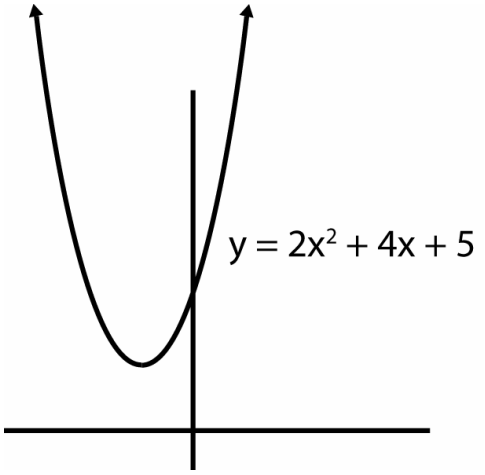
orientation_*UP*__ *y*-intercept_*(0, -4)* vertex_*(-1, -7)* sketch_____

4. Solve graphically. Show a complete graph with the solutions labeled and circled. Also, label specifically what you graphed. Round your answers to two decimal places.

$5 = 2x^2 - 3x$

Two alternative methods for solving graphically	
Solve $5 = 2x^2 - 3x$.	*Solve* $0 = 2x^2 - 3x - 5$.
	
Solutions are -1 and 2.5.	*Solutions are -1 and 2.5.*

5. Draw the graph that would be used to solve $0 = 2x^2 + 4x + 5$. Explain, using the graph, why this equation has no real solution. Use your QUADRATC (or QUAD2) program to find the complex solutions.



There is no point on the graph where y is zero. So there is no solution to $0 = 2x^2 + 4x + 5$ *in the real numbers. If we extend our possibilities to the complex numbers, we see there are two complex numbers that make the equation* $0 = 2x^2 + 4x + 5$ *true. The QUADRATC (or QUAD2) program tells us that the two complex solutions are* $x = -1 \pm 1.22i$.