Name: Date:

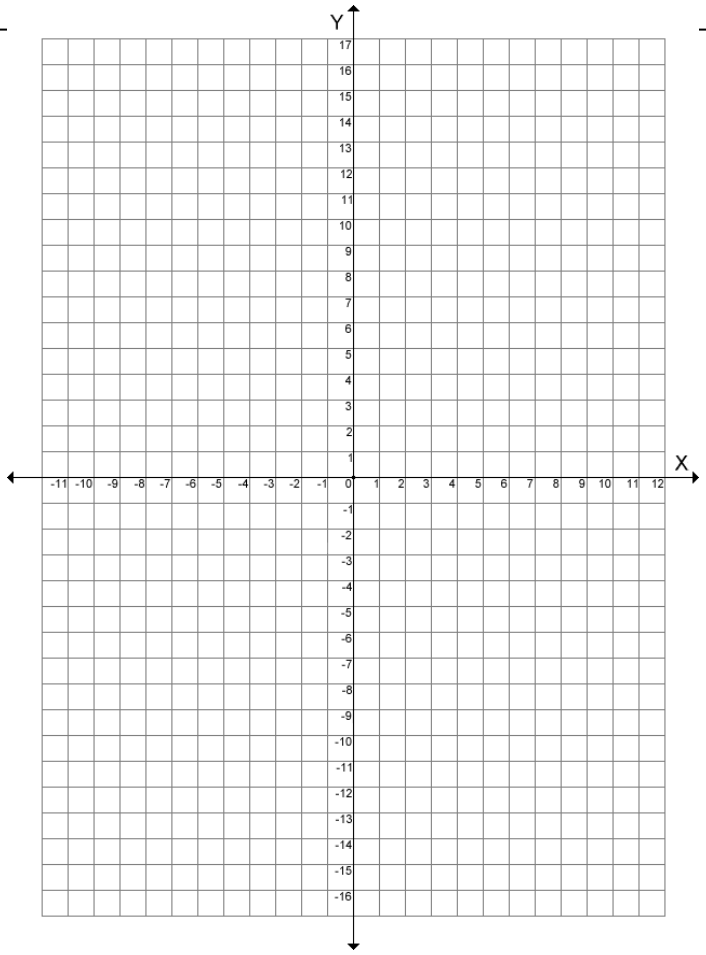
Scarsdale Middle School Popham House Mr. Weiss

Quiz: Parabolas and Quadratics – Level 3

1) Solve the system of equations graphically.

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

$y = -x + 6$



2) Solve by completing the square. *Leave your answer in simplest radical form*.

$x^2 - 10x + 13 = 0$

3) Solve using the quadratic formula. *Round your answers to the nearest hundredth*.

$2x^2 + 6x - 9 = 0$

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

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4) Solve by completing the square. *Solutions are rational so no rounding needed*.

$4x^2 - 16x + 15 = 0$

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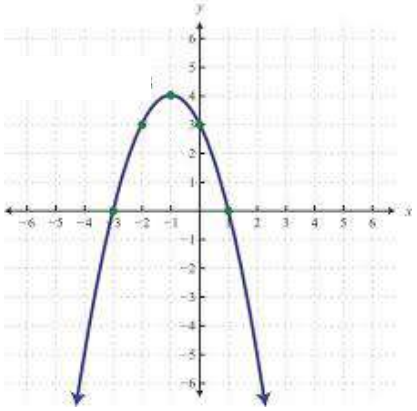
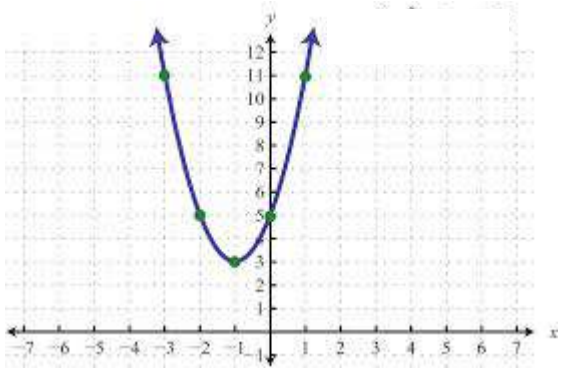
5) Convert the equation from standard form to vertex form. Then, name the vertex.

$y - 3x^2 - 18x + 1 = 0$

6) Write the equation of each parabola. Use vertex form.





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7) An object is launched upward from a platform 128 feet high with an initial velocity of 112 ft/sec. Use the formula: $h(t) = -16t^2 + v_0t + h_0$. *Show all work algebraically (no GC).*

a) How long will it take the object to reach maximum height?
b) What is the maximum height?
c) How long until the object reaches the ground?

8) Solve the system of equations algebraically. *Use the substitution method*

$y = x^2 + 7x - 3$
$3x + 2y = -42$

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9) For the parabola with equation expressed below, find each. *Use an algebraic solution (No GC).*

$$y = 3(x + 4)^2 - 27$$

a) y-intercept

b) roots

10) Solve for x. Use completing the square. *Leave answers in simplest radical form*.

$8x^2 - 24x + 9 = 0$

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11) Find the maximum integer value of *a,* such that the equation below has more than one solution.

$ax^2 - 9x + 5 = 0$

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12) Find the number of integer solutions of *b* such that parabola with the equation below does not intersect the x-axis.

$4x^2 + bx + 7 = 0$

13) If a movie theatre charges $8 for a showing, all 500 seats will be sold. For every $1 of price increase, 20 fewer tickets will sell.

a. What prices will yield revenue of $5320? b. What price will yield the maximum revenue?

14) A flare is launched from a lifeboat at an initial height of 4 feet and an initial velocity of 150 feet per second. For how many seconds will the flare be at or above 200 feet? *Round to the nearest hundredth.*

Bonus: Solve the system of equations algebraically. *Leave any irrational numbers in radical form. Must us an algebraic method only (NO GC). Must have all answers to get credit.*

$x^2 + y^2 = 41$
$y = x^2 - 11$