

Algebra 2 Chapter 5 Pre-Test

1.) (5 pts total, 2.5 pts each) Rewrite each function in standard form. Indicate whether the function is a quadratic.

a) $(x - 7)(x - 7)$

x^2 × constant

b) $2(x + 2)^2 - 2x^2$

2.) (5 pts) Find a quadratic model for the following set of values:

$(-4, 8), (-1, 5), (1, 13)$
 $x = -4, y = 8$

$ax^2 + bx + c = y$
 $a(-4)^2 + b(-4) + c = 8$
 $16a - 4b + c = 8$

3.) (10 pts total, 5 pts each) Graph each parabola. Label the vertex and axis of symmetry.

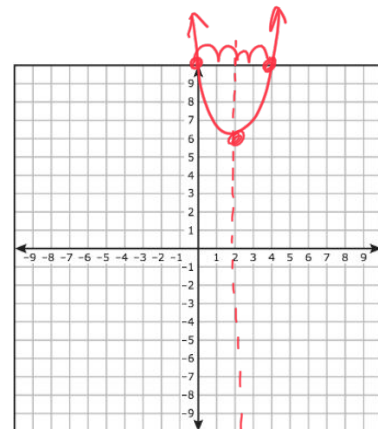
a) $x^2 - 4x + 10$ ← y-int $a=1$
 $b=-4$
 $c=10$

2 ways to Find Vertex

1.) $\left(-\frac{b}{2a}, f\left(-\frac{b}{2a}\right)\right) - \left(\frac{-(-4)}{2(1)}\right) = -(-2) = 2$

$x=2$ $f(2) = (2)^2 - 4(2) + 10$ $(2, 6)$
 $4 - 8 + 10$

$-4 + 10 = 6$ axis of symmetry: $x=2$



2.) Complete the Square
 ↳ vertex formula

$$\left(\frac{-4}{2}\right)^2$$
$$(-2)^2 = 4$$

$$(x^2 - 4x) + 10$$

↑ ↑
+4 -4

1.) 2020 it
2.) Factor out "a"
3.) $\left(\frac{b}{2}\right)^2$

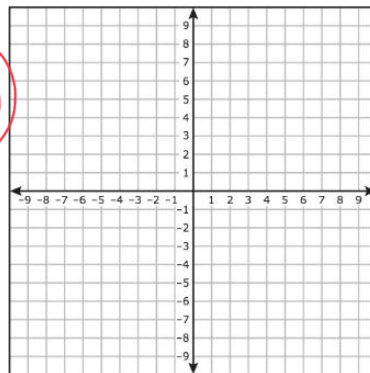
$$(x^2 - 4x + 4) + 6$$

↓ ↓ ↓
2 2 2

$$(x - 2)^2 + 6$$

b) $2x^2 + 12x + 17$

Vertex $(2, 6)$



4.) (20 pts total, 5 pts each) Factor each expression.

a) $x^2 + 5x - 14$

b) $x^2 + 7x + 12$

c) $2x^2 - 13x + 15$

d) $3x^2 - 5x - 12$

5.) (10 pts total, 2.5 pts each) Evaluate the discriminant of the equation. Indicate the number of real roots for each.

a) $x^2 - 4x + 4$

b) $-2x^2 + 6x - 14$

c) $x^2 + 9x + 18$

d) $2x^2 + 11x - 21$

6.) (15 pts total, 7.5 pts each) Solve using the Quadratic Equation.

a) $x^2 = 3x + 2$

b) $3x^2 - 5x = -12$

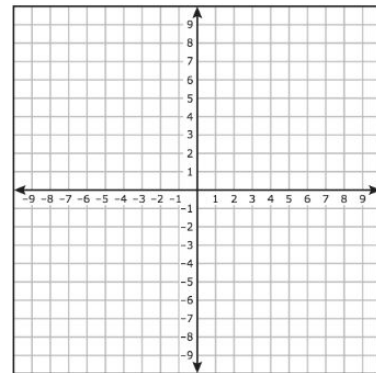
7.) (15 pts total, 7.5 pts each) Place each equation in vertex form by completing the square.
Please show all your work.

a) $x^2 = 5x + 14$

b) $2x^2 + 6x - 7 = 0$

8.) (20 pts total, 10 pts each) Graph each equation **completely**. Plot all roots, intercepts, and the vertex.

a) $x^2 + 6x + 9$



b) $x^2 - 4x - 5$

