

# Algebra 2-1 Test and Exam

## Review 5.1 - 5.3

Name Key

Hour \_\_\_\_\_

1.) Write the standard form of a quadratic function.

$$y = ax^2 + bx + c$$

2.) Determine whether each function is linear or quadratic. Identify quadratic, linear, and constant terms.

$$y = (4 - x)(4x + 2)$$

$$16x + 8 - 4x^2 - 2x$$

$$-4x^2 + 14x + 8$$

Linear or Quadratic?

Quadratic Term:  $-4x^2$

Linear Term:  $14x$

Constant Term:  $8$

$$y = x + 2x^2 - 5$$

$$2x^2 + x - 5$$

Linear or Quadratic?

Quadratic Term:  $2x^2$

Linear Term:  $x$

Constant Term:  $-5$

$$y = 3x(x - 3) - 3x^2$$

$$3x^2 - 9x - 3x^2$$

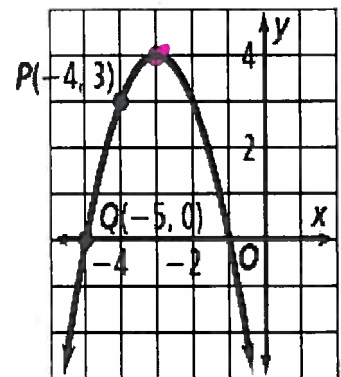
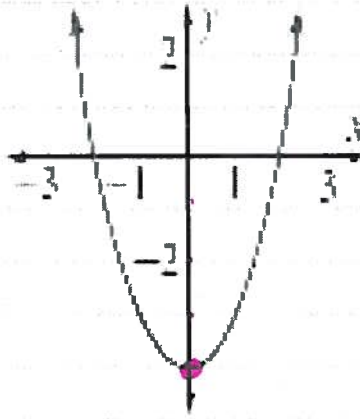
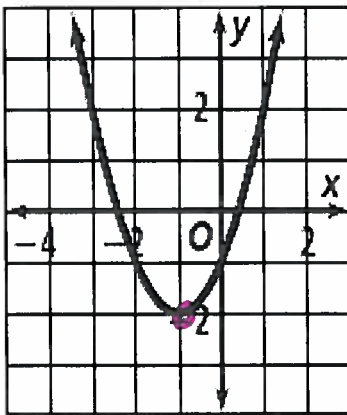
Linear or Quadratic?

Quadratic Term:  $\emptyset$

Linear Term:  $-9x$

Constant Term:  $\emptyset$

3.) Identify the vertex and axis of symmetry of each parabola.



|                               |                              |                               |
|-------------------------------|------------------------------|-------------------------------|
| Vertex: $(-1, -2)$            | Vertex: $(0, -4)$            | Vertex: $(-3, 4)$             |
| Maximum or <u>Minimum</u>     | Maximum or <u>Minimum</u>    | <u>Maximum</u> or Minimum     |
| Axis of Symmetry:<br>$x = -1$ | Axis of Symmetry:<br>$x = 0$ | Axis of Symmetry:<br>$x = -3$ |

4.) Fill in the table for each function.

| $y = x^2 - 6x + 2$   | $y = -x^2 + 4x + 1$   | $y = 2x^2 - 6x + 4$   |
|--|---|---|
| $a = \underline{1}$ $b = \underline{-6}$ $c = \underline{2}$     | $a = \underline{-1}$ $b = \underline{4}$ $c = \underline{1}$        | $a = \underline{2}$ $b = \underline{-6}$ $c = \underline{4}$  |
| AOS: $x = \frac{6}{2(1)} = \frac{6}{2} = 3$ $x = 3$              | AOS: $x = \frac{-4}{2(-1)} = \frac{-4}{-2} = 2$ $x = 2$             | AOS: $x = \frac{6}{2(2)} = \frac{6}{4} = \frac{3}{2}$ $x = \frac{3}{2} = 1.5$   |
| Vertex: $(3)^2 - 6(3) + 2$<br>$9 - 18 + 2 = -9 + 2$<br>$(3, -7)$ | Vertex: $(2)^2 + 4(2) + 1$<br>$-4 + 8 + 1 = -4 + 9 = 5$<br>$(2, 5)$ | Vertex: $v(1.5, -0.5)$<br>$\frac{2}{1}(\frac{3}{2}) - \frac{6}{1}(\frac{3}{2}) + 4 = 3 - 9 + 4 = -2$<br>$\frac{3}{2} \cdot \frac{3}{2} - \frac{6}{2} \cdot \frac{3}{2} + 4 = \frac{9}{4} - 9 + 4 = \frac{9}{4} - 4 = \frac{9}{4} - \frac{16}{4} = -\frac{7}{4}$ |
| Y-Intercept:<br>$(0, 2)$   | Y-Intercept:<br>$(0, 1)$  | Y-Intercept:<br>$(0, 4)$  |
| Graph:<br>   | Graph:<br>  | Graph:<br>  |

5.) Write the vertex form of a quadratic function.

$$y = a(x-h)^2 + k$$

6.) Determine the following for the below functions.

| $y = x^2 + x - 8$  | $y = -5x^2 + 10x$   |
|--|---|
| Vertex: $\frac{-1}{2(1)} = -\frac{1}{2}$ $v(-\frac{1}{2}, -8\frac{1}{4})$<br>$v(-.5, -8.25)$ | $x$ $x = \frac{-10}{2(-5)} = \frac{-10}{-10} = 1$ $v(1, 5)$ |
| Vertex Form:<br>$y = 1(x + .5) - 8.25$   | $y = -5(x - 1)^2 + 5$                                       |

7.) Graph the equation  $y=(x+3)^2 - 5$ .

Be sure to label the (a) axis of symmetry, (b) vertex, (c) y-intercept, and (d) two other 'useful' points.

(a)  $x = -3$

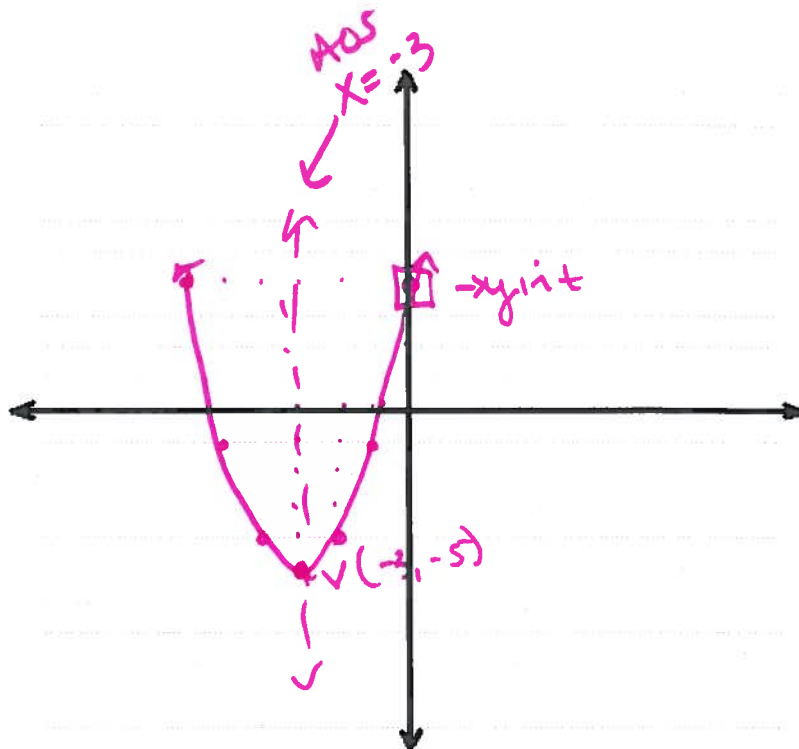
(b)  $v(-3, -5)$

(c)  $y = (0+3)^2 - 5$   
 $9 - 5$

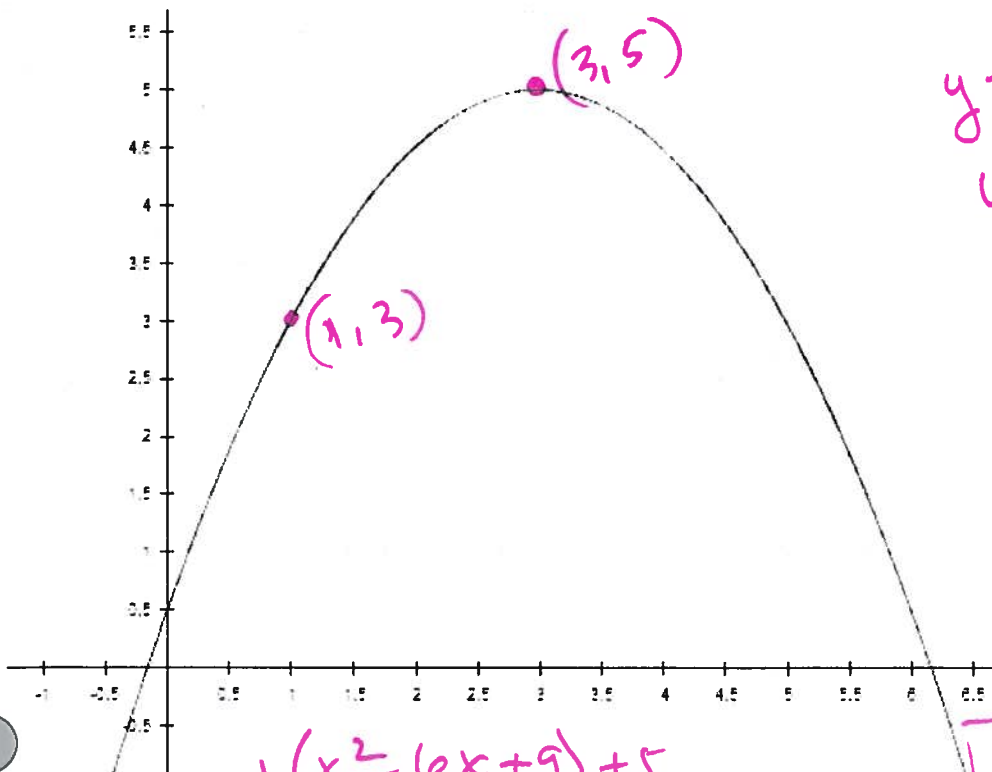
$y = 4 \rightarrow (0, 4)$

(d)

| x  | y  |
|----|----|
| -1 | -1 |
| -2 | -4 |
| -3 | -5 |
| -4 | -4 |
| -5 | -1 |



8.) What is the equation of the graph below (any form will work)?



Given  $a = -1$

$$y = a(x-h)^2 + k$$

$$y = a(x-3)^2 + 5$$

$$3 = a(1-3)^2 + 5$$

$$3 = a(4) + 5$$

$$3 = 4a + 5$$

$$-2 = 4a$$

$$a = -1$$

$$-1(x^2 - 6x + 9) + 5$$

$$y = -x^2 + 6x - 9 + 5$$

$$y = -1(x-3)^2 + 5$$

$$y = -x^2 + 6x - 4$$

