

Name Answer Key

Algebra 1

10.1 Worksheet

Per. _____ Date _____

Graphing Quadratics

Show all work, when necessary, in the space provided.

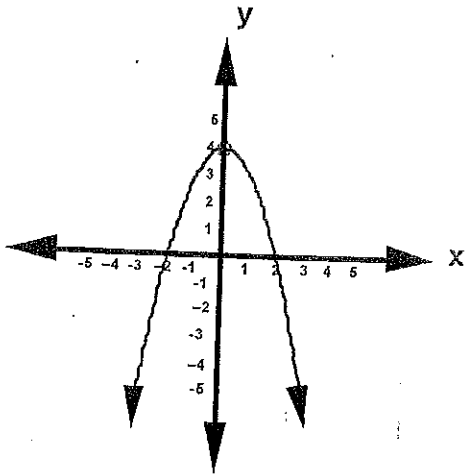
For question 1 - 6, identify the maximum or minimum point, the axis of symmetry, and the roots (zeros) of the graph of the quadratic function shown, as indicated.

Section 1:

1. Maximum point: $(0, 4)$

Axis of Symmetry: $x = 0$

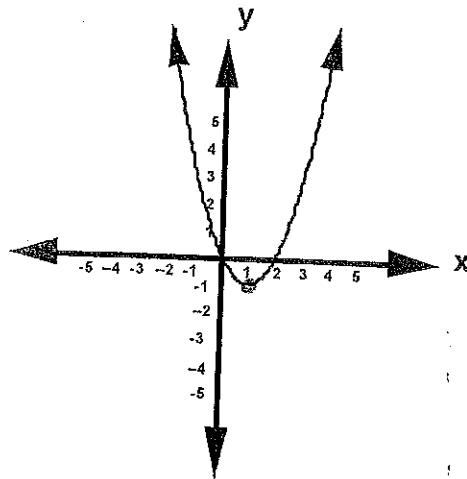
Roots: $(-2, 0)$ $(2, 0)$



3. Minimum point: $(1, -1)$

Axis of Symmetry: $x = 1$

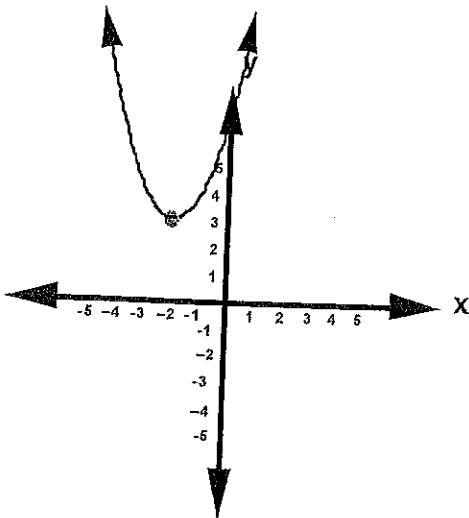
Roots: $(0, 0)$ $(2, 0)$



2. Minimum point: $(-2, 3)$

Axis of Symmetry: $x = -2$

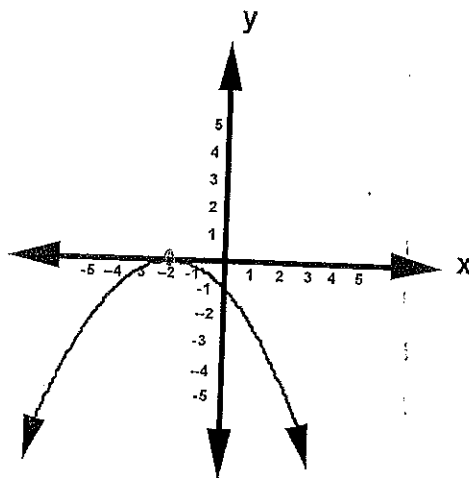
Roots: none



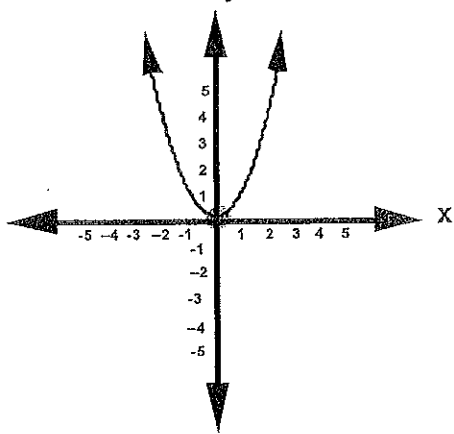
4. Maximum point: $(-2, 0)$

Axis of Symmetry: $x = -2$

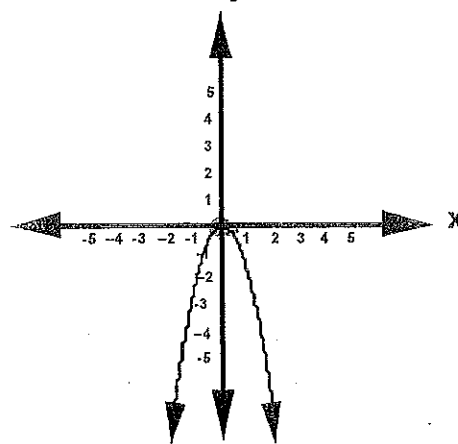
Roots: $(-2, 0)$



5. Minimum point: $(0, 0)$
 Axis of Symmetry: $x=0$
 Roots: $(0, 0)$



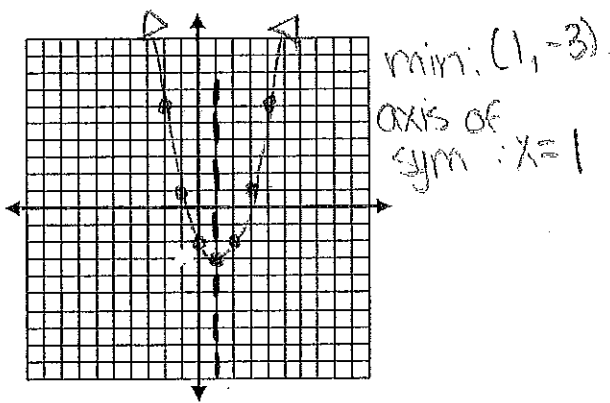
6. Maximum point: $(0, 0)$
 Axis of Symmetry: $x=0$
 Roots: $(0, 0)$



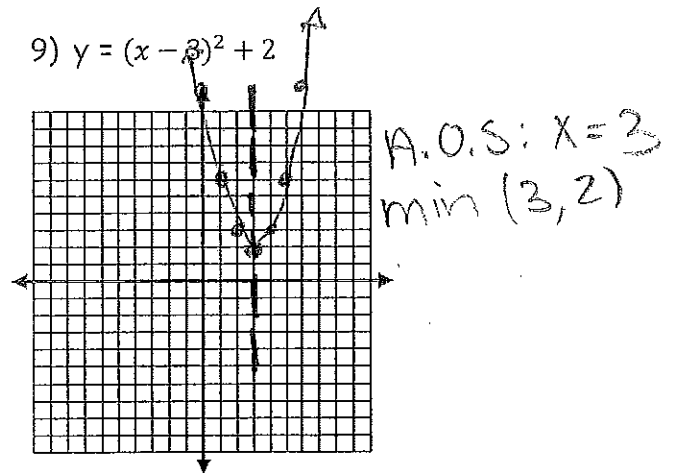
Section 2:

For questions 7 - 16, sketch the graph of the function on the provided graphs. Label the vertex and axis of symmetry.

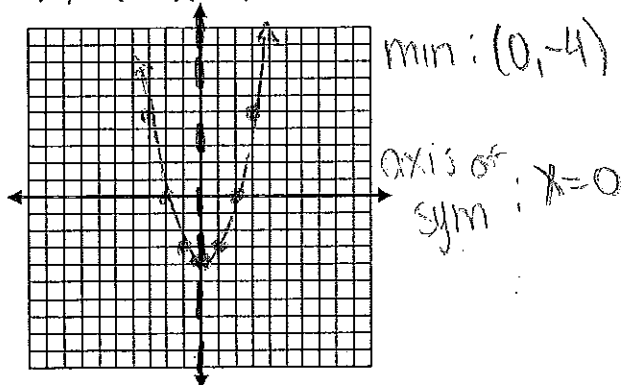
7) $y = x^2 - 2x - 2$



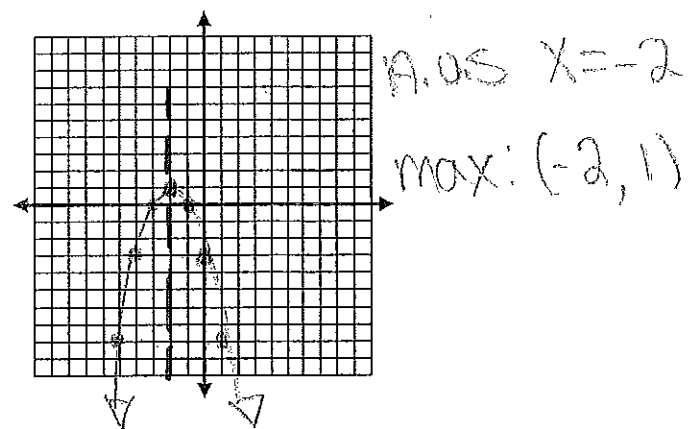
9) $y = (x - 3)^2 + 2$



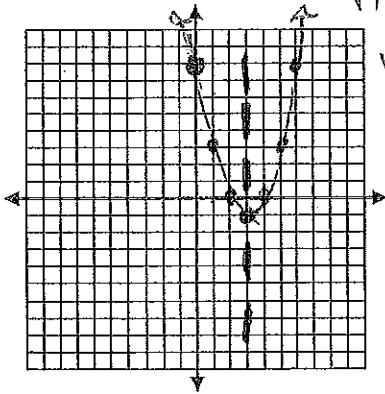
8) $y = (x+2)(x-2)$



10) $y = -x^2 - 4x - 3$



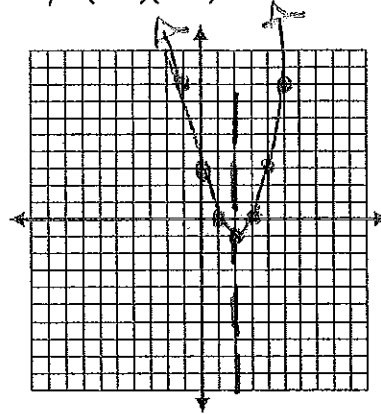
11) $y = (x-4)(x-2)$



A.O.S. $x=3$
min: $(3, -1)$

14)

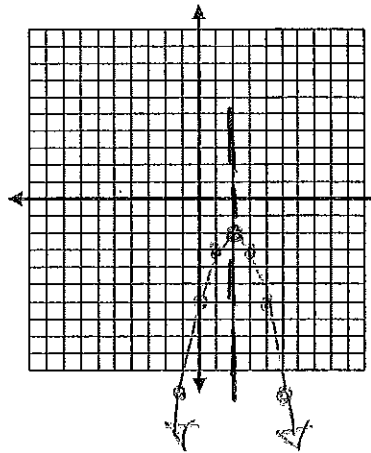
$y = (x-1)(x-3)$



A.O.S. $x=2$
min $(2, -1)$

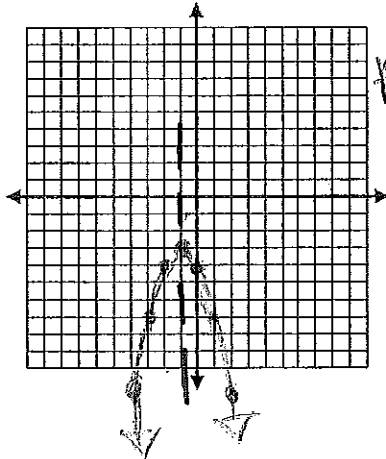
15)

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



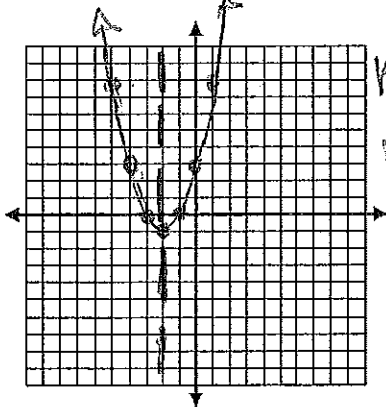
A.O.S. $x=2$
max: $(2, -2)$

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



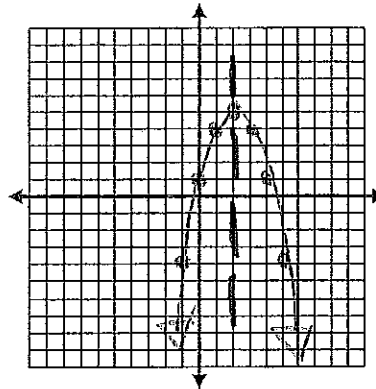
A.O.S. $x=-1$
max: $(-1, -3)$

13) $y = x^2 + 4x + 3$



A.O.S. $x=-2$
min $(-2, -1)$

16) $y = -x^2 + 4x + 1$



A.O.S. $x=2$
max: $(2, 5)$

7)

$$\frac{-b}{2a} = \frac{-(-2)}{2} = \frac{2}{2} = 1$$

$$y = (1)^2 - 2(1) - 2$$

$$y = 1 - 2 - 2$$

$$y = -3$$

x	y
1	-3
2	-2
3	1
4	6

$$9-6-2$$

$$16-8-2$$

$$8) y = (x+2)(x-2)$$

$$y = x^2 - 4$$

$$\frac{-b}{2a} = \frac{-0}{2} = 0$$

$$\text{min } y = (0)^2 - 4$$

$$y = -4$$

x	y
0	-4
1	-3
2	0
3	5

$$9) y = (x-3)^2 + 2$$

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

$$y = x^2 - 6x + 11$$

$$\frac{-b}{2a} = \frac{6}{2} = 3$$

$$y = (3)^2 - 6(3) + 11$$

$$9 - 18 + 11$$

$$y = 2$$

x	3	2	1	0
y	2	3	6	11

$$10) y = x^2 - 4x - 3$$

$$\frac{-b}{2a} = \frac{4}{2} = 2$$

$$y = (-2)^2 - 4(-2) - 3$$

$$-4 + 8 - 3$$

$$y = 1$$

x	-2	-1	0	1
y	1	0	-3	-8

$$-1 + 4 - 3$$

$$-1 - 4 - 3$$

$$11) y = (x-4)(x-2)$$

$$y = x^2 - 6x + 8$$

$$\frac{-b}{2a} = \frac{6}{2} = 3$$

$$y = (3)^2 - 6(3) + 8$$

$$y = 9 - 18 + 8$$

$$y = -1$$

x	3	2	1	0
y	-1	0	3	8

$$\begin{aligned}
 12) & -(x+1)^2 - 3 \\
 & -(x^2 + 2x + 1) - 3 \\
 & -x^2 - 2x - 1 - 3 \\
 & y = -x^2 - 2x - 4 \\
 \frac{-b}{2a} & = \frac{2}{-2} = -1
 \end{aligned}$$

$$\begin{aligned}
 y & = -(-1)^2 - 2(-1) - 4 \\
 y & = -1 + 2 - 4 \\
 y & = -3
 \end{aligned}$$

x	-1	0	1	2
y	-3	-4	-7	-12

-1-2-4 -4-4-4

$$\begin{aligned}
 13) & y = x^2 + 4x + 3 \\
 \frac{-b}{2a} & = \frac{-4}{2} = -2 \\
 y & = (-2)^2 + 4(-2) + 3 \\
 & \quad 4 - 8 + 3 \\
 & \quad -1
 \end{aligned}$$

x	-2	-1	0	1
y	-1	0	3	8

$$\begin{aligned}
 14) & y = (x-1)(x-3) \\
 & y = x^2 - 4x + 3 \\
 \frac{-b}{2a} & = \frac{4}{2} = 2 \\
 y & = (2)^2 - 4(2) + 3 \\
 & \quad 4 - 8 + 3 \\
 & \quad y = -1
 \end{aligned}$$

x	2	1	0	-1
y	-1	0	3	8

$$\begin{aligned}
 15) & y = -(x-2)^2 - 2 \\
 & -(x^2 - 4x + 4) - 2 \\
 y & = -x^2 + 4x - 6 \\
 \frac{-b}{2a} & = \frac{4}{-2} = -2 \\
 y & = -(2)^2 + 4(2) - 6 \\
 & \quad -4 + 8 - 6 \\
 & \quad y = -2
 \end{aligned}$$

x	2	1	0	-1
y	-2	-3	-6	-11

$$\begin{aligned}
 16) & y = -x^2 + 4x + 1 \\
 \frac{-b}{2a} & = \frac{-4}{-2} = 2 \\
 y & = -(2)^2 + 4(2) + 1 \\
 & \quad -4 + 8 + 1 \\
 & \quad y = 5
 \end{aligned}$$

x	2	1	0	-1
y	5	4	1	-4