

Unit 2 Review Handout

1. These quadratic functions can be factored. Find the x-intercepts, the y-intercept, the coordinates of the vertex, and the equation of the axis of symmetry. Then, sketch the graph and label the features.

a) $y = x^2 - 6x - 7$

b) $y = x^2 + 12x + 32$

c) $y = -3x^2 + 14x - 16$

d) $y = 6x^2 - 7x - 3$

e) $y = -64x^2 + 16x - 1$

2. These quadratic functions cannot be factored. Find the x-intercepts, the y-intercept, the coordinates of the vertex, and the equation of the axis of symmetry of each function. Then, sketch the graph and label the features.

a) $y = -4x^2 - 8x + 1$

b) $y = 3x^2 + 3x - 4$

c) $y = \frac{1}{2}x^2 + 5x + 4$

d) $y = 0.27x^2 - 2.16x + 0.5$

e) $y = -2x^2 + 14x - 3$

3. For each quadratic function find the x-intercepts, the vertex, the y intercept and one other point, then graph

a) $y = x^2 - 6x - 16$

b) $y = -2x^2 + 4x + 30$

c) $y = 5x^2 - 5x - 30$

d) $y = 6x^2 + 32x + 32$

e) $y = -2x^2 - 8x + 10$

f) $y = -3x^2 + 6x$

g) $y = 3x^2 - 12$

h) $y = (x - 5)^2$

4. For each quadratic function state:

- i) the vertex ii) the max or min value
iii) when the max or min occurs
iv) x-intercepts v) the y intercept

a) $y = 3(x + 2)^2 + 1$

b) $y = -x^2 - 8x + 20$

c) $y = (x + 6)(3x - 7)$

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

e) $y = 4x^2 + 8x + 3$

f) $y = -4(x + 1)(2x - 5)$

Answers:

- 1. a)** x-intercepts: 7 and -1; y-intercept: -7; vertex: (3, -16); equation of axis of symmetry: $x = 3$; Sketches may vary.
- b)** x-intercepts: -8 and -4; y-intercept: 32; vertex: (-6, -4); equation of axis of symmetry: $x = -6$; Sketches may vary.
- c)** x-intercepts: $\frac{8}{3}$ and 2; y-intercept: -16; vertex: $(\frac{7}{3}, \frac{1}{3})$; equation of axis of symmetry: $x = \frac{7}{3}$; Sketches may vary.
- d)** x-intercepts: $-\frac{1}{3}$ and $\frac{3}{2}$; y-intercept: -3; vertex: $(\frac{7}{12}, \frac{121}{24})$; equation of axis of symmetry: $x = \frac{7}{12}$; Sketches may vary.
- e)** x-intercept: $\frac{1}{8}$; y-intercept: -1; vertex: $(\frac{1}{8}, 0)$; equation of axis of symmetry: $x = \frac{1}{8}$; Sketches may vary.
- 2. a)** $x \doteq -2.12$ or $x \doteq 0.12$; y-intercept: 1; vertex: approximately (-1, 5); equation of axis of symmetry: $x = -1$; Sketches may vary.
- b)** $x \doteq 0.76$ or $x \doteq -1.76$; y-intercept: -4; vertex: approximately (-0.5, -4.75); equation of axis of symmetry: $x = -0.5$; Sketches may vary.
- c)** $x \doteq -0.88$ or $x \doteq -9.12$; y-intercept: 4; vertex: approximately (-5, -8.5); equation of axis of symmetry: $x = -5$; Sketches may vary.
- d)** $x \doteq 7.76$ or $x \doteq 0.24$; y-intercept: 0.5; vertex: approximately (4, -3.82); equation of axis of symmetry: $x = 4$; Sketches may vary.
- e)** $x \doteq 0.22$ or $x \doteq 6.78$; y-intercept: -3; vertex: approximately (3.5, 21.5); equation of axis of symmetry: $x = 3.5$; Sketches may vary.

3.

	x-int	Vertex	y-int	Other pt
a)	8 and -2	(3,-25)	-16	(6,-16)
b)	5 and -3	(1,32)	30	(2,30)
c)	3 and -2	(0.5, -31.25)	-30	(1,-30)
d)	$\frac{-4}{3}$ and -4	$(\frac{-8}{3}, \frac{-32}{3})$	32	$(\frac{-16}{3}, 32)$
e)	-5 and 1	(-2,18)	10	(-4,10)
f)	0 and 2	(1,3)	0	(2,0)
g)	-2 and 2	(0,-12)	-12	(1,9) and (-1,9)
h)	5	(5,0)	25	(10, 25)

4.

	Vertex	Max/Min	occurs at	x-int	y-int
a)	(-2,1)	Min of 1	$x = -2$	none	13
b)	(-4,36)	Max of 36	$x = -4$	-10 and 2	20
c)	approx(-1.83,-52.08)	Min of -52.08	$x = -1.83$	-6 and $\frac{7}{3}$	-42
d)	(4,-3)	Max of -3	$x = 4$	None	-35
e)	(-1,-1)	Min of -1	$x = -1$	$\frac{-1}{2}$ and $\frac{-3}{2}$	-35
f)	$(\frac{3}{4}, \frac{49}{2})$	Max of $\frac{49}{2}$	$x = \frac{3}{4}$	-1 and $\frac{5}{2}$	20