

Score: _____

NAME: Key

Assessment Training Practice #3C

1.) Show all your work to find the x-intercept(s)/zero(s)/solution(s) of:

1a.) $f(x) = (x - 9)(x + 2)$

$$x - 9 = 0 \quad \text{or} \quad x + 2 = 0$$

$$x = 9 \quad \text{or} \quad x = -2$$

1b.) $f(x) = x^2 - 11x + 30$

~~$$\begin{array}{r} 30 \\ -5 \quad -6 \\ + \\ -11 \end{array}$$~~

x	x^2	$-6x$
-5	$-5x$	30

$$(x - 6)(x - 5) = 0$$

$$x - 6 = 0 \quad \text{or} \quad x - 5 = 0$$

$$x = 6 \quad \text{or} \quad x = 5$$

1c.) $f(x) = x(3x - 7)$

$$x(3x - 7) = 0$$

$$x = 0 \quad \text{or} \quad 3x - 7 = 0$$

$$x = 0 \quad \text{or} \quad 3x = 7$$

$$x = 0 \quad \text{or} \quad x = \frac{7}{3}$$

1d.) $f(x) = 6x^2 - 13x + 6$

	$2x$	-3
$3x$	$6x^2$	$-9x$
-2	$-4x$	6

$$(2x-3)(3x-2) = 0$$

$$2x-3 = 0 \text{ or } 3x-2 = 0$$

$$2x = 3 \text{ or } 3x = 2$$

$$x = \frac{3}{2} \text{ or } x = \frac{2}{3}$$

1e.) $f(x) = 35x^2 - 22x + 3$

	$7x$	-3
$5x$	$35x^2$	$-15x$
-1	$-7x$	3

$$(7x-3)(5x-1) = 0$$

$$7x-3 = 0 \text{ or } 5x-1 = 0$$

$$7x = 3 \text{ or } 5x = 1$$

$$x = \frac{3}{7} \text{ or } x = \frac{1}{5}$$

1f.) $f(x) = 2(4x - 5)(x + 3)$

$$4x - 5 = 0 \text{ or } x + 3 = 0$$

$$4x = 5 \text{ or } x = -3$$

$$x = \frac{5}{4} \text{ or } x = -3$$

2.) Find the vertex of each function. Identify if the vertex is a maximum or a minimum.

2a.) $f(x) = -4(x + 2)^2 - 3$

$$f(x) = -4(x - (-2))^2 + -3$$

Vertex: $(-2, -3)$

Maximum or Minimum

2b.) $f(x) = x^2 + 4x + 3$

$$x = \frac{-b}{2a} \quad x = \frac{-4}{2 \cdot 1} \quad x = \frac{-4}{2} \quad x = -2$$
$$y = (-2)^2 + 4(-2) + 3$$
$$y = 4 + -8 + 3$$
$$y = -1$$

Vertex: $(-2, -1)$

Maximum or Minimum

2c.) $f(x) = 4x^2 - 16x + 13$

$$x = \frac{-b}{2a} \quad x = \frac{16}{2 \cdot 4} \quad x = \frac{16}{8} \quad x = 2$$
$$y = 4(2)^2 - 16(2) + 13$$
$$y = 16 - 32 + 13$$
$$y = -3$$

Vertex: $(2, -3)$

Maximum or Minimum

2d.) $f(x) = -(x - 2)^2$

$$f(x) = -(x - 2)^2 + 0$$

Vertex: $(2, 0)$

Maximum or Minimum

2e.) $f(x) = x^2 - 3$

$$f(x) = (x - 0)^2 + -3$$

Vertex: $(0, -3)$

Maximum or Minimum

2f.) $f(x) = (x - 2)^2 - 3$

$$f(x) = (x - 2)^2 + -3$$

Vertex: $(2, -3)$

Maximum or Minimum

3.) Find the x-intercept(s) and y-intercept of each function.

3a.) $f(x) = 7x^2 - 6x$ $a = 7$ $b = -6$ $c = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \qquad x = \frac{6 \pm 6}{14}$$

$$x = \frac{6 \pm \sqrt{36 - 4 \cdot 7 \cdot 0}}{2 \cdot 7}$$

$$x = \frac{12}{14} \qquad x = \frac{6}{7}$$

$$x = \frac{6 \pm \sqrt{36}}{14}$$

$$x = \frac{0}{14} \qquad x = 0$$

x-intercept(s): $(\frac{6}{7}, 0), (0, 0)$ c value y-intercept: $(0, 0)$

3b.) $f(x) = x^2 - 8x - 6$ $a = 1$ $b = -8$ $c = -6$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \qquad x = \frac{8 \pm \sqrt{4} \sqrt{22}}{2}$$

$$x = \frac{8 \pm \sqrt{64 - 4 \cdot 1 \cdot -6}}{2 \cdot 1}$$

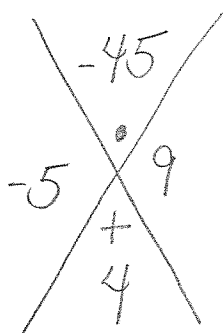
$$x = \frac{8 \pm 2\sqrt{22}}{2}$$

$$x = \frac{8 \pm \sqrt{88}}{2}$$

$$x = 4 \pm \sqrt{22}$$

x-intercept(s): $(4 + \sqrt{22}, 0), (4 - \sqrt{22}, 0)$ c value y-intercept: $(0, -6)$

3c.) $f(x) = 15x^2 + 4x - 3$



	$5x$	3
$3x$	$15x^2$	$9x$
-1	$-5x$	-3

$$(5x+3)(3x-1) = 0$$

$$5x+3 = 0 \text{ or } 3x-1 = 0$$

$$5x = -3 \text{ or } 3x = 1$$

$$x = \frac{-3}{5} \text{ or } x = \frac{1}{3}$$

x-intercept(s): $(\frac{-3}{5}, 0), (\frac{1}{3}, 0)$ c value y-intercept: $(0, -3)$

4.) What is the vertex of $g(x) = (x + 4)^2 - 2$? $g(x) = (x - (-4))^2 + -2$
 Vertex: $(-4, -2)$

Which of the following has the **same vertex** as $g(x)$? Identify/show work for the vertex for each function.

a.) $h(x) = -(x - 4)^2 - 2$
 $h(x) = -(x - 4)^2 + -2$

Vertex: $(4, -2)$ Same or **Different**

b.) $f(x) = x^2 + 8x + 15$
 $x = \frac{-b}{2a} \quad x = \frac{-8}{2 \cdot 1} \quad x = -4$ $y = (-4)^2 + 8(-4) + 15$
 $y = -1$

Vertex: $(-4, -1)$ Same or **Different**

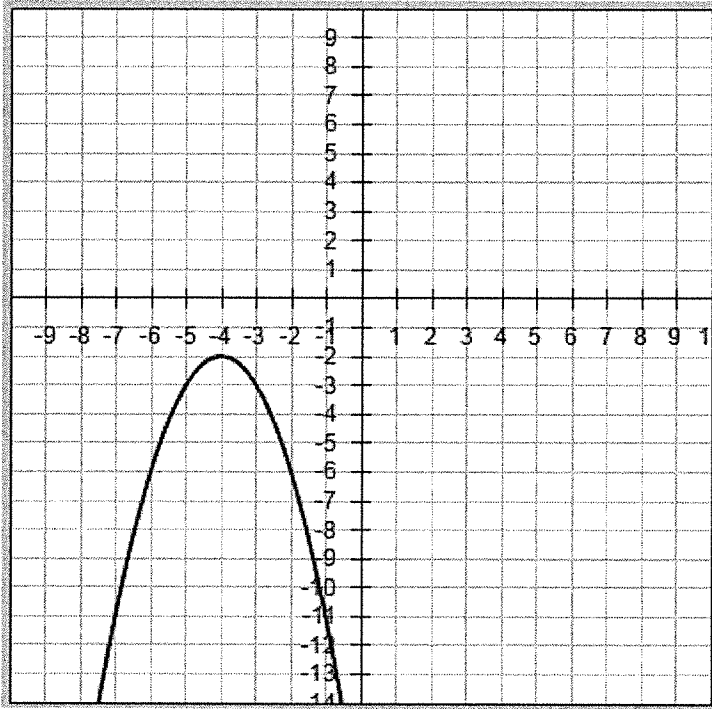
c.) $p(x) = 3x^2 + 24x + 50$
 $x = \frac{-b}{2a} \quad x = \frac{-24}{2 \cdot 3} \quad x = -4$ $y = 3(-4)^2 + 24(-4) + 50$
 $y = 2$

Vertex: $(-4, 2)$ Same or **Different**

d.) $q(x) = (x + 4)(x + 2)$
 $x^2 + 2x + 4x + 8 \quad x = \frac{-b}{2a} \quad x = \frac{-6}{2 \cdot 1} \quad x = -3$
 $x^2 + 6x + 8$ $y = (-3)^2 + 6(-3) + 8$
 $y = -1$

Vertex: $(-3, -1)$ Same or **Different**

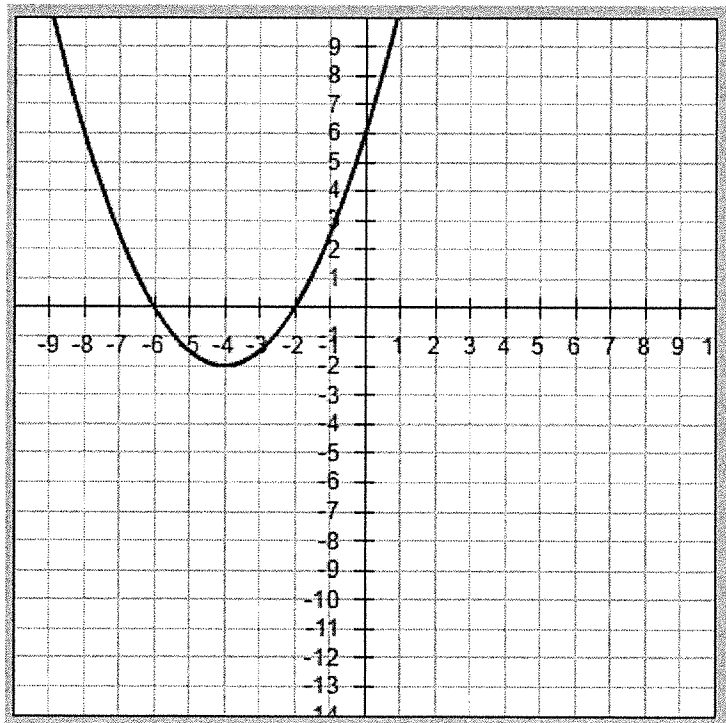
e.)



Vertex: (-4, -2)

Same or Different

f.)

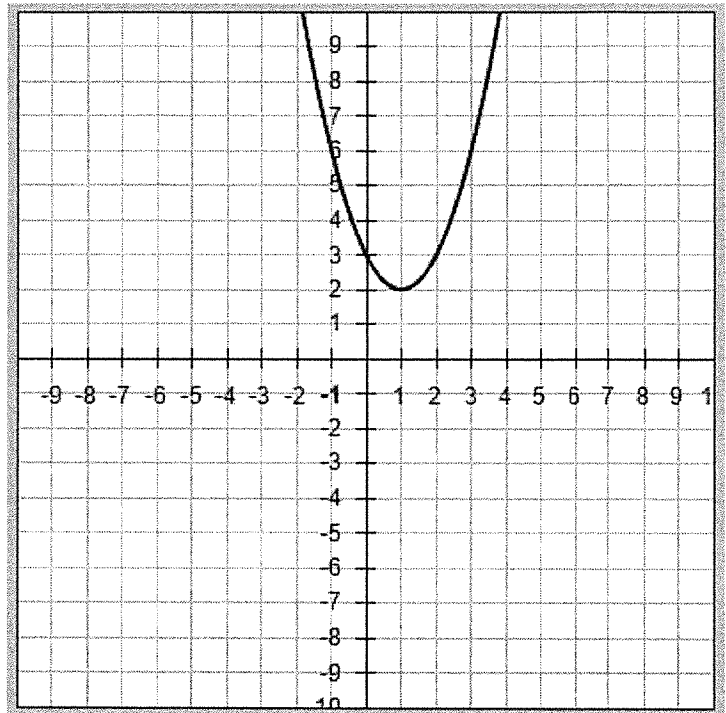


Vertex: (-4, -2)

Same or Different

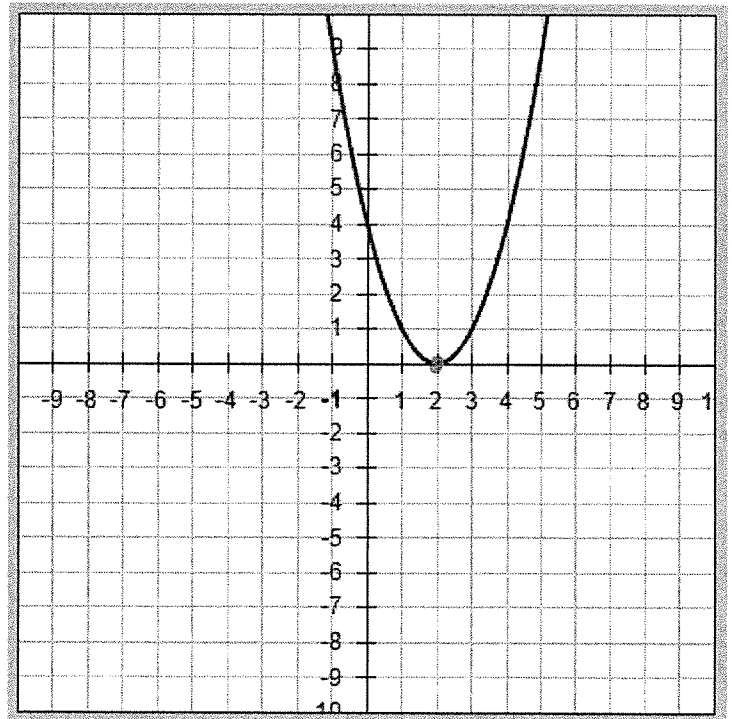
- 5.) Determine the number of **real number** solutions for the following quadratic function. Show the solutions on the graph. Explain how you know the number of real number solutions.

There are no
x-intercepts on the
graph therefore
there are 0 real
number solutions.
There are two
imaginary solutions.



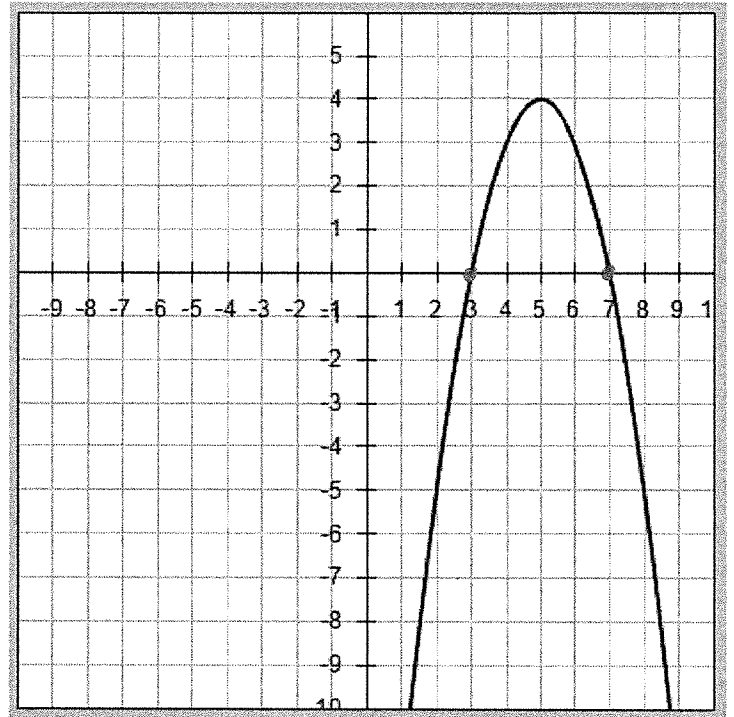
- 6.) Determine the number of **real number** solutions for the following quadratic function. Show the solutions on the graph. Explain how you know the number of real number solutions.

There is 1 x-intercept
on the graph, therefore,
there is 1 real number
solution.



- 7.) Determine the number of **real number** solutions for the following quadratic function. Show the solutions on the graph. Explain how you know the number of real number solutions.

There are 2
x-intercepts on the
graph, therefore,
there are 2 real
number solutions.



- 8.) Find the roots of $-2x^2 + 9x + 29 = -6$

Show all work! Round answers to the nearest hundredth if necessary.

$$\begin{array}{r} -2x^2 + 9x + 29 = -6 \\ + 6 + 6 \end{array}$$

$$-2x^2 + 9x + 35 = 0$$

$$\begin{array}{r} \begin{array}{r} -70 \\ -5 \cdot 14 \\ + \\ 9 \end{array} \quad \begin{array}{r} -x \quad 7 \\ 2x \quad -2x^2 \quad 14x \\ 5 \quad -5x \quad 35 \end{array} \end{array}$$

$$\begin{aligned} (-x+7)(2x+5) &= 0 \\ -1(x-7)(2x+5) &= 0 \\ x-7=0 \text{ or } 2x+5=0 \\ x=7 \text{ or } 2x=-5 \\ x &= \frac{-5}{2} \end{aligned}$$

$$x = 7 \text{ or } x = \frac{-5}{2}$$

9.) Find the zeros of $z^2 + 10z + 4 = -5$ Show all work! Round answers to the nearest

$$z^2 + 10z + 4 = -5$$

$$\quad \quad \quad +5 \quad +5$$

$$z^2 + 10z + 9 = 0$$

$$\begin{array}{r} 9 \\ 1 \quad + \quad 9 \\ \hline 10 \end{array}$$

	z	9
z	z^2	$9z$
1	$1z$	9

hundredth if necessary.

$$(z+9)(z+1) = 0$$

$$z+9=0 \text{ or } z+1=0$$

$$z = -9 \text{ or } z = -1$$

10.) Solve the equation: $-2c^2 + 17c - 12 = 9$ Show all work! Round answers to the

$$-2c^2 + 17c - 12 = 9$$

$$\quad \quad \quad -9 \quad -9$$

$$-2c^2 + 17c - 21 = 0$$

$$a = -2$$

$$b = 17$$

$$c = -21$$

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

$$x = \frac{-17 \pm \sqrt{289 - 4 \cdot (-2) \cdot (-21)}}{2 \cdot (-2)}$$

$$x = \frac{-17 \pm \sqrt{121}}{-4}$$

nearest hundredth if necessary.

$$x = \frac{-17 \pm 11}{-4}$$

$$x = \frac{-17+11}{-4} \quad x = \frac{-17-11}{-4}$$

$$c = \frac{3}{2} \text{ or } c = 7$$

11.) Solve: $-x^2 - 2x + 7 = -17$

Show all work! Round answers to the nearest hundredth if necessary.

$a = -1$
 $b = -2$
 $c = 24$

$+17 \quad +17$

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

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

$$x = \frac{2 \pm \sqrt{4 - 4 \cdot -1 \cdot 24}}{2 \cdot -1}$$

$$x = \frac{2 \pm \sqrt{100}}{-2}$$

$$x = \frac{2 \pm 10}{-2}$$

$$x = \frac{2 + 10}{-2}$$

$$x = \frac{2 - 10}{-2}$$

$$x = -6 \text{ or } x = 4$$

12.) Find all the zeros of: $-2x^2 - 13x - 18 = 0$

Show all work! Round answers to the nearest hundredth if necessary.

$a = -2$
 $b = -13$
 $c = -18$

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

$$x = \frac{13 \pm \sqrt{169 - 4 \cdot -2 \cdot -18}}{2 \cdot -2}$$

$$x = \frac{13 \pm \sqrt{25}}{-4}$$

$$x = \frac{13 \pm 5}{-4}$$

$$x = \frac{13 + 5}{-4}$$

$$x = \frac{13 - 5}{-4}$$

$$x = -4.5 \text{ or } x = -2$$

13.) Find the roots of: $x^2 - 8 = -2x$

Show all work! Round answers to

nearest hundredth if necessary.

$$\begin{array}{r} x^2 - 8 = -2x \\ +2x \quad +2x \end{array}$$

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

$$a=1 \quad x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$b=2$$

$$c=-8 \quad x = \frac{-2 \pm \sqrt{4 - 4 \cdot 1 \cdot -8}}{2 \cdot 1}$$

$$x = \frac{-2 \pm \sqrt{36}}{2}$$

$$x = \frac{-2 \pm 6}{2}$$

$$x = \frac{-2 + 6}{2}$$

$$x = \frac{-2 - 6}{2}$$

$$x = 2 \text{ or } x = -4$$

14.) Solve: $x^2 - 4x + 6 = 3$

Show all work! Round answers to

$$\begin{array}{r} x^2 - 4x + 6 = 3 \\ -3 \quad -3 \end{array}$$

nearest hundredth if necessary.

$$x^2 - 4x + 3 = 0$$

$$a=1 \quad x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$b=-4$$

$$c=3$$

$$x = \frac{4 \pm \sqrt{16 - 4 \cdot 1 \cdot 3}}{2 \cdot 1}$$

$$x = \frac{4 \pm \sqrt{4}}{2}$$

$$x = \frac{4 \pm 2}{2}$$

$$x = \frac{4 + 2}{2}$$

$$x = \frac{4 - 2}{2}$$

$$x = 3 \text{ or } x = 1$$