Score: _____ NAME: Key

Assessment Training Practice #3A

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

1a.) $f(x) = (x + 7)(x - 3)$

$x + 7 = 0$ or $x - 3 = 0$

$x = -7$ or $x = 3$

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

-6, 6, -1, $+$, 5

	$2x$	-1
x	$2x^2$	$-1x$
3	$6x$	-3

$(2x - 1)(x + 3) = 0$

$2x - 1 = 0$ or $x + 3 = 0$

$2x = 1$ or $x = -3$

$x = \frac{1}{2}$ or $x = -3$

1c.) $f(x) = x(2x + 5)$

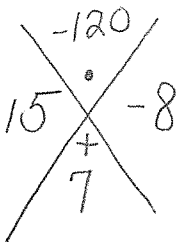
$x(2x + 5) = 0$

$x = 0$ or $2x + 5 = 0$

$x = 0$ or $2x = -5$

$x = 0$ or $x = \frac{-5}{2}$

1d.) $f(x) = 6x^2 + 7x - 20$



	$3x$	-4
$2x$	$6x^2$	$-8x$
5	$15x$	-20

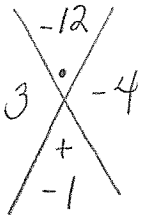
$(2x+5)(3x-4)=0$

$2x+5=0$ or $3x-4=0$

$2x=-5$ or $3x=4$

$x=\frac{-5}{2}$ or $x=\frac{4}{3}$

1e.) $f(x) = x^2 - x - 12$



	x	-4
x	x^2	$-4x$
3	$3x$	-12

$(x-4)(x+3)=0$

$x-4=0$ or $x+3=0$

$x=4$ or $x=-3$

1f.) $f(x) = 3(4x - 3)(x - 1)$

$3(4x-3)(x-1)=0$

$4x-3=0$ or $x-1=0$

$4x=3$ or $x=1$

$x=\frac{3}{4}$ or $x=1$

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

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

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

$h \quad K$

Vertex: $(-3, -4)$ (Maximum) or Minimum

2b.) $f(x) = 2x^2 - 4x + 1$

$x = \frac{-b}{2a} \quad x = \frac{4}{4} \quad x = 1$

$y = 2\cdot(1)^2 - 4\cdot 1 + 1$

$y = 2 - 4 + 1$

$y = -1$

Vertex: $(1, -1)$ Maximum or (Minimum)

2c.) $f(x) = 3x^2 + 6x - 5$

$x = \frac{-b}{2a} \quad x = \frac{-6}{6} \quad x = -1$

$y = 3(-1)^2 + 6\cdot -1 - 5$

$y = 3 + -6 - 5$

$y = -8$

Vertex: $(-1, -8)$ Maximum or (Minimum)

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

$f(x) = -1(x-3)^2 + 0$

$h \quad K$

Vertex: $(3, 0)$ (Maximum) or Minimum

2e.) $f(x) = x^2 - 1$

$f(x) = (x-0)^2 + -1$

$h \quad K$

Vertex: $(0, -1)$ Maximum or (Minimum)

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

$h \quad K$

Vertex: $(5, 3)$ Maximum or (Minimum)

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

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

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

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

$$x = \frac{4 \pm \sqrt{8}}{2}$$

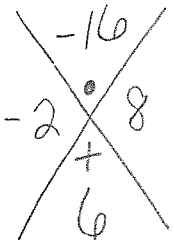
$$x = \frac{4 \pm \sqrt{4}\sqrt{2}}{2}$$

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

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

x-intercept(s): $x = 2 + \sqrt{2}$, $x = 2 - \sqrt{2}$ y-intercept: $(0, 2)$ (c value)

3b.) $f(x) = x^2 + 6x - 16$



	x	8
x	x^2	$8x$
-2	$-2x$	-16

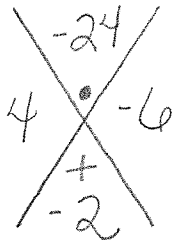
$$(x+8)(x-2) = 0$$

$$x + 8 = 0 \text{ or } x - 2 = 0$$

$$x = -8 \text{ or } x = 2$$

x-intercept(s): $x = -8$, $x = 2$ y-intercept: $(0, -16)$ (c value)

3c.) $f(x) = x^2 - 2x - 24$



	x	-6
x	x^2	$-6x$
4	$4x$	-24

$$(x-6)(x+4) = 0$$

$$x - 6 = 0 \text{ or } x + 4 = 0$$

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

x-intercept(s): $x = 6$, $x = 4$ y-intercept: $(0, -24)$ (c value)

4.) What is the vertex of $g(x) = (x - 3)^2 + 2$?

h K

Vertex: $(3, 2)$

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

a.) $h(x) = -2(x - 3)^2 - 2$

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

h K

Vertex: $(3, -2)$ Same or (Different)

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

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

h K

Vertex: $(-3, 2)$ Same or (Different)

c.) $p(x) = x^2 - 6x + 11$

$x = \frac{-b}{2a}$ $x = \frac{6}{2 \cdot 1}$ $x = \frac{6}{2}$ $x = 3$

$y = 3^2 - 6 \cdot 3 + 11$

$y = 9 - 18 + 11$

$y = 2$

Vertex: $(3, 2)$ (Same) or Different

d.) $q(x) = (x - 3)(x + 2)$

$x^2 + 2x - 3x - 6$

$x^2 - x - 6$

$x = \frac{-b}{2a}$ $x = \frac{1}{2}$

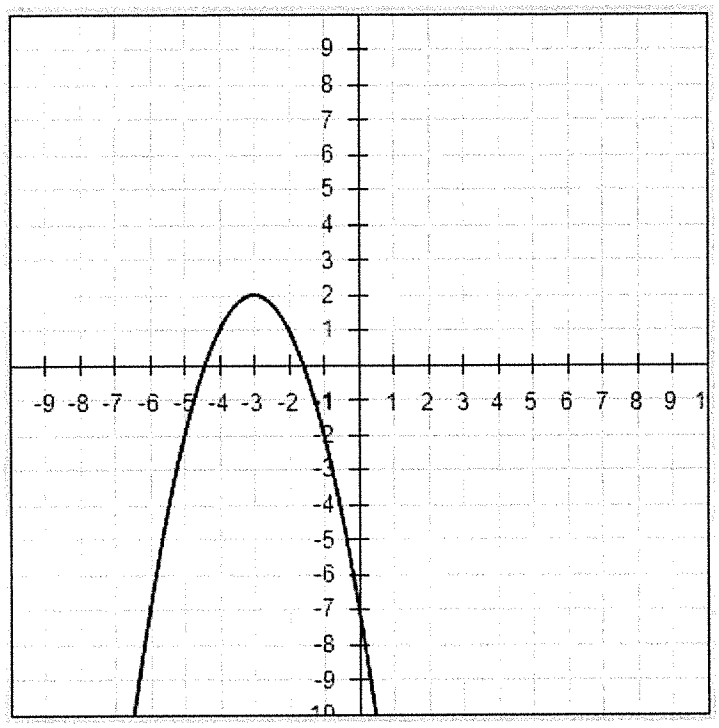
$y = \left(\frac{1}{2}\right)^2 - \frac{1}{2} - 6$

$y = \frac{1}{4} - \frac{1}{2} - 6$

Vertex: $\left(\frac{1}{2}, -\frac{25}{4}\right)$ Same or (Different)

$(.5, -6.25)$

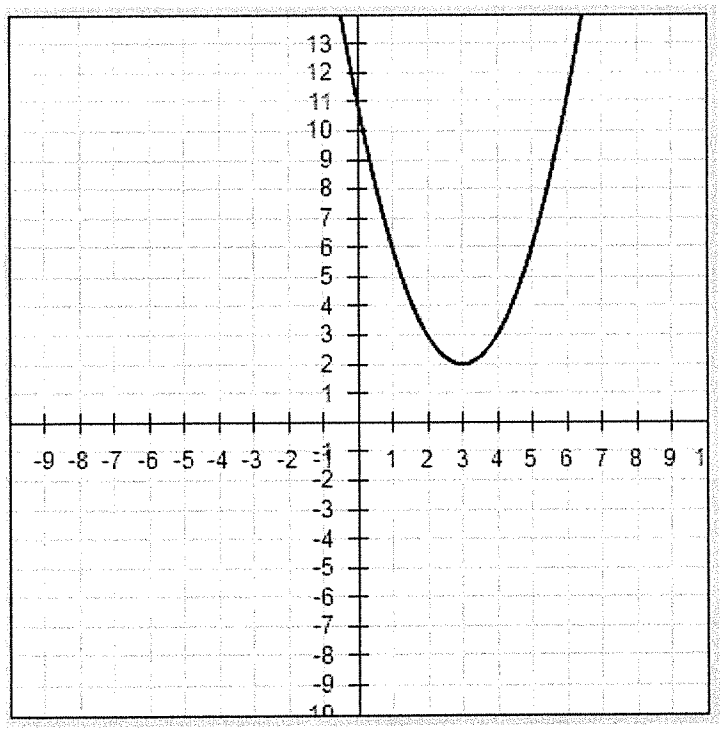
e.)



Vertex: (-3, 2)

Same or (Different)

f.)

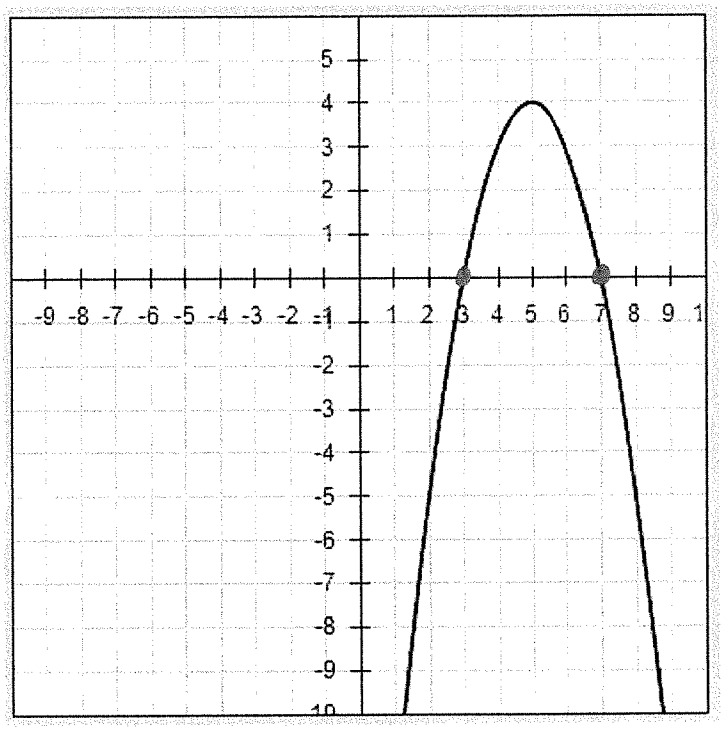


Vertex: (3, 2)

(Same) or Different

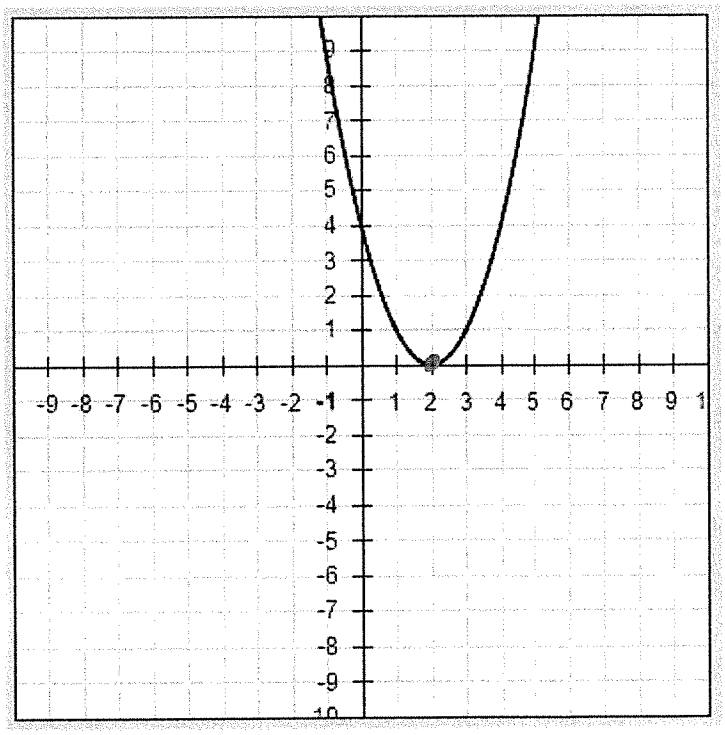
5.) Determine the number of **real number** solutions for the following quadratic function. Show the solutions on the graph. Explain how you know the number of real number solutions.

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



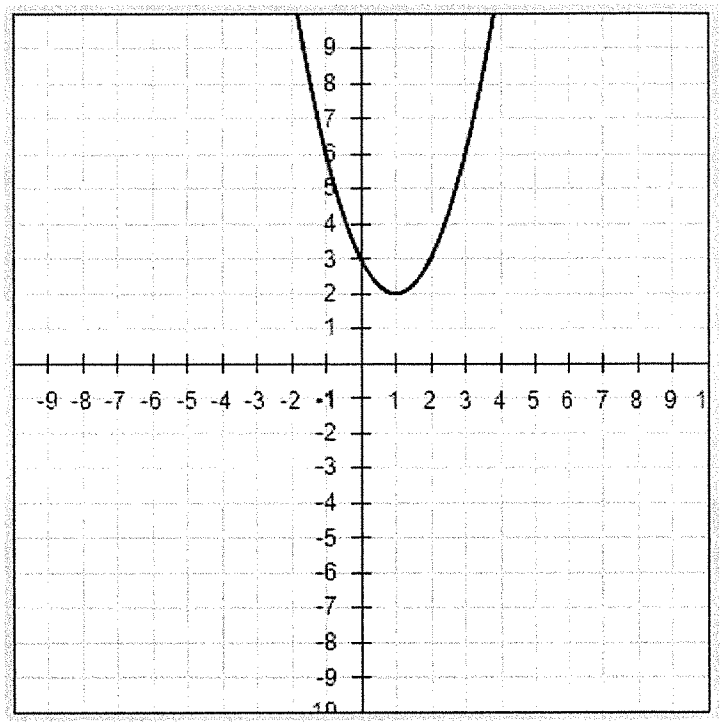
6.) Determine the number of **real number** solutions for the following quadratic function. Show the solutions on the graph. Explain how you know the number of real number solutions.

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



8.) Find the roots of $4x^2 - 15 = 9$ **Show all work! Round answers to the nearest hundredth if necessary.**

$4x^2 - 15 = 9$
$-9 \quad -9$
$4x^2 - 24 = 0$

$a = 4$
$b = 0$
$c = -24$

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

$$x = \frac{0 \pm \sqrt{0^2 - 4 \cdot 4 \cdot -24}}{2 \cdot 4}$$

$$x = \frac{0 \pm \sqrt{384}}{8}$$

$$x = \frac{0 \pm \sqrt{64}\sqrt{6}}{8}$$

$$x = \frac{0 \pm 8\sqrt{6}}{8}$$

$$x = \frac{8\sqrt{6}}{8}$$

$$x = -\frac{8\sqrt{6}}{8}$$

$x = \sqrt{6} \quad x \approx 2.45$
$x = -\sqrt{6} \quad x \approx -2.45$

9.) Find the zeros of $z^2 + 6z - 27 = 0$ **Show all work! Round answers to the nearest hundredth if necessary.**

$a = 1$
$b = 6$
$c = -27$

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

$$x = \frac{-6 \pm \sqrt{36 - 4 \cdot 1 \cdot -27}}{2 \cdot 1}$$

$$x = \frac{-6 \pm \sqrt{144}}{2}$$

$$x = \frac{-6 \pm 12}{2}$$

$$x = \frac{-6 + 12}{2}$$

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

$$x = 3$$

$$x = \frac{-6 - 12}{2}$$

$$x = \frac{-18}{2}$$

$$x = -9$$

$x = 3$
$x = -9$

10.) Solve the equation: $c^2 - 3c = 0$ **Show all work! Round answers to the nearest hundredth if necessary.**

$a = 1$
$b = -3$
$c = 0$

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

$$x = \frac{3 \pm \sqrt{9 - 4 \cdot 1 \cdot 0}}{2 \cdot 1}$$

$$x = \frac{3 \pm \sqrt{9}}{2}$$

$$x = \frac{3 \pm 3}{2}$$

$$x = \frac{3 + 3}{2}$$

$$x = \frac{3 - 3}{2}$$

$x = 3$
$x = 0$

11.) Solve: $10x^2 - 7x = 33$ **Show all work! Round answers to the nearest hundredth if necessary.**

$-33 \quad -33$

$10x^2 - 7x - 33 = 0$

$a = 10$

$b = -7$

$c = -33$

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

$$x = \frac{7 \pm \sqrt{49 - 4 \cdot 10 \cdot -33}}{2 \cdot 10}$$

$$x = \frac{7 \pm \sqrt{1369}}{20}$$

$$x = \frac{7 \pm 37}{20}$$

$$x = \frac{7+37}{20}$$

$$x = \frac{7-37}{20}$$

$x = 2.2$

$x = -1.5$

12.) Find all the zeros of: $2x^2 + 15x + 28 = 0$ **Show all work! Round answers to the nearest hundredth if necessary.**

$a = 2$

$b = 15$

$c = 28$

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

$$x = \frac{-15 \pm \sqrt{225 - 4 \cdot 2 \cdot 28}}{2 \cdot 2}$$

$$x = \frac{-15 \pm \sqrt{1}}{4}$$

$$x = \frac{-15 \pm 1}{4}$$

$$x = \frac{-15 + 1}{4}$$

$$x = \frac{-15 - 1}{4}$$

$x = -3.5$

$x = -4$

13.) Find the roots of: $2x^2 - 7x - 13 = 0$ **Show all work! Round answers to nearest hundredth if necessary.**

$a = 2$
$b = -7$
$c = -13$

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

$$x = \frac{7 \pm \sqrt{49 - 4 \cdot 2 \cdot -13}}{2 \cdot 2}$$

$$x = \frac{7 \pm \sqrt{153}}{4}$$

$$x = \frac{7 \pm \sqrt{9}\sqrt{17}}{4}$$

$$x = \frac{7 \pm 3\sqrt{17}}{4}$$

$$x = \frac{7 + 3\sqrt{17}}{4}$$

$x \approx 4.84$

$$x = \frac{7 - 3\sqrt{17}}{4}$$

$x \approx -1.34$

14.) Solve: $6x^2 + 13x + 6 = 0$ **Show all work! Round answers to nearest hundredth if necessary.**

$a = 6$
$b = 13$
$c = 6$

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

$$x = \frac{-13 \pm \sqrt{169 - 4 \cdot 6 \cdot 6}}{2 \cdot 6}$$

$$x = \frac{-13 \pm \sqrt{25}}{12}$$

$$x = \frac{-13 \pm 5}{12}$$

$$x = \frac{-13 + 5}{12}$$

$x = -.\overline{6}$

$$x = \frac{-13 - 5}{12}$$

$x = -1.5$