Score: _____ NAME: Key

Assessment Training Practice #3B

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

1a.) $f(x) = (x - 8)(x - 4)$

$x - 8 = 0$ or $x - 4 = 0$

$x = 8$ or $x = 4$

1b.) $f(x) = 2x^2 - 5x - 12$

-24, 3, -8, $+$, -5

	x	-4
$2x$	$2x^2$	$-8x$
3	$3x$	-12

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

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

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

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

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

$x(3x-4) = 0$

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

$x = 0$ or $3x = 4$

$x = 0$ or $x = \frac{4}{3}$

1d.) $f(x) = 6x^2 - x - 35$

-210, 14, -15, $+$, -1

	$2x$	-5
$3x$	$6x^2$	$-15x$
7	$14x$	-35

$(2x-5)(3x+7) = 0$

$2x - 5 = 0$ or $3x + 7 = 0$

$2x = 5$ or $3x = -7$

$x = \frac{5}{2}$ or $x = \frac{-7}{3}$

1e.) $f(x) = 2x^2 + 7x - 15$

-30, 10, -3, $+$, 7

	$2x$	-3
x	$2x^2$	$-3x$
5	$10x$	-15

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

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

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

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

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

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

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

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

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

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

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

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

Vertex: $(-2,-4)$ Maximum or (Minimum)

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

$x=\frac{-b}{2a}$ $x=\frac{-1}{2\cdot3}$ $x=\frac{-1}{6}$ $y=3(\frac{-1}{6})^2+\frac{-1}{6}-4$

$y=-4.08\overline{3}$ or $-\frac{49}{12}$

Vertex: $(\frac{-1}{6},-\frac{49}{12})$ Maximum or (Minimum)

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

$x=\frac{-b}{2a}$ $x=\frac{4}{2\cdot4}$ $x=\frac{4}{8}$ $x=\frac{1}{2}$ $y=4(\frac{1}{2})^2-4(\frac{1}{2})-3$

$y=-4$

Vertex: $(\frac{1}{2},-4)$ Maximum or (Minimum)

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

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

Vertex: $(-2,0)$ (Maximum) or Minimum

2e.) $f(x) = x^2 - 4$

$f(x)=(x-0)^2+-4$

Vertex: $(0,-4)$ Maximum or (Minimum)

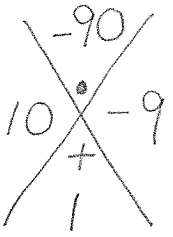
2f.) $f(x) = -(x - 2)^2 + 6$

$h \quad k$

Vertex: $(2, 6)$ (Maximum) or Minimum

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

3a.) $f(x) = 6x^2 + x - 15$



	$2x$	-3
$3x$	$6x^2$	$-9x$
5	$10x$	-15

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

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

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

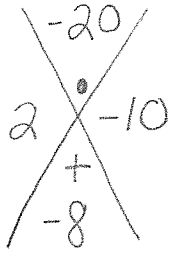
$x=\frac{3}{2}$ or $x=-\frac{5}{3}$

x-intercept(s): $(\frac{3}{2}, 0), (-\frac{5}{3}, 0)$

c value

y-intercept: $(0, -15)$

3b.) $f(x) = 4x^2 - 8x - 5$



	$2x$	-5
$2x$	$4x^2$	$-10x$
1	$2x$	-5

$(2x-5)(2x+1) = 0$

$2x-5=0$ or $2x+1=0$

$2x=5$ or $2x=-1$

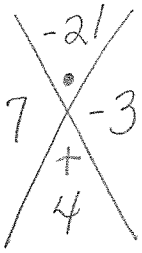
$x=\frac{5}{2}$ or $x=-\frac{1}{2}$

x-intercept(s): $(\frac{5}{2}, 0), (-\frac{1}{2}, 0)$

c value

y-intercept: $(0, -5)$

3c.) $f(x) = x^2 + 4x - 21$



	x	-3
x	x^2	$-3x$
7	$7x$	-21

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

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

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

x-intercept(s): $(3, 0), (-7, 0)$

c value

y-intercept: $(0, -21)$

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

Vertex: $(4, -2)$ (h, k)

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

a.) $h(x) = 2x^2 - 16x + 14$

$x = \frac{-b}{2a}$ $x = \frac{16}{2 \cdot 2}$ $x = \frac{16}{4}$ $x = 4$ $y = 2(4)^2 - 16(4) + 14$ $y = -18$

Vertex: $(4, -18)$ Same or (Different)

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

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

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

c.) $p(x) = 3x^2 - 24x + 46$

$x = \frac{-b}{2a}$ $x = \frac{24}{2 \cdot 3}$ $x = \frac{24}{6}$ $x = 4$ $y = 3(4)^2 - 24(4) + 46$ $y = -2$

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

d.) $q(x) = (x - 4)(x - 2)$

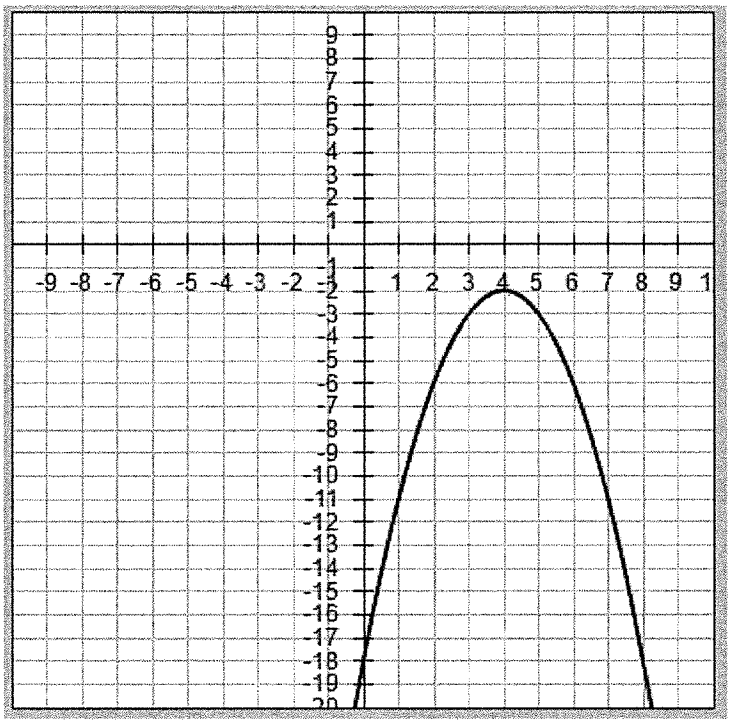
$g(x) = x^2 - 2x - 4x + 8$

$g(x) = x^2 - 6x + 8$

$x = \frac{-b}{2a}$ $x = \frac{6}{2}$ $x = 3$ $y = 3^2 - 6 \cdot 3 + 8$ $y = -1$

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

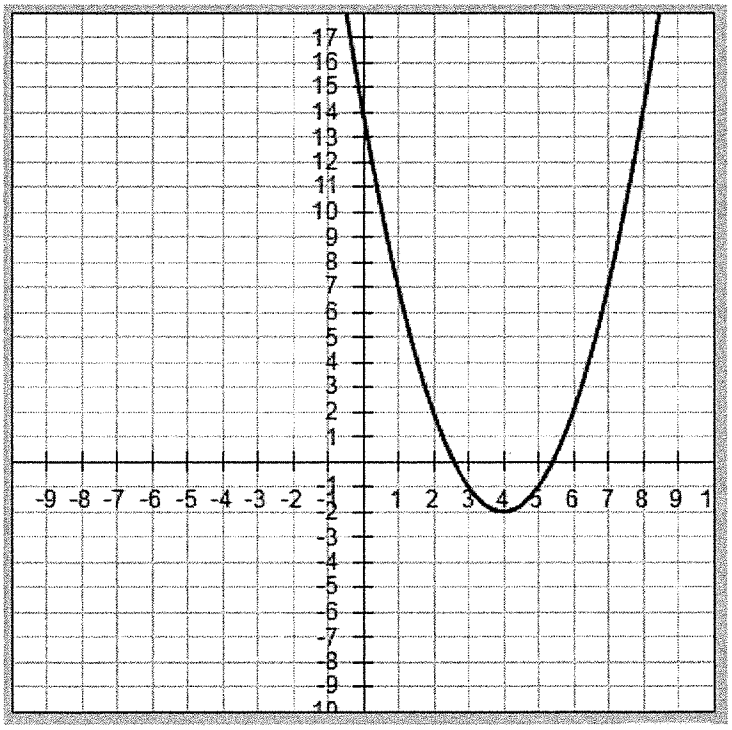
e.)



Vertex: (4, -2)

Same or Different

f.)

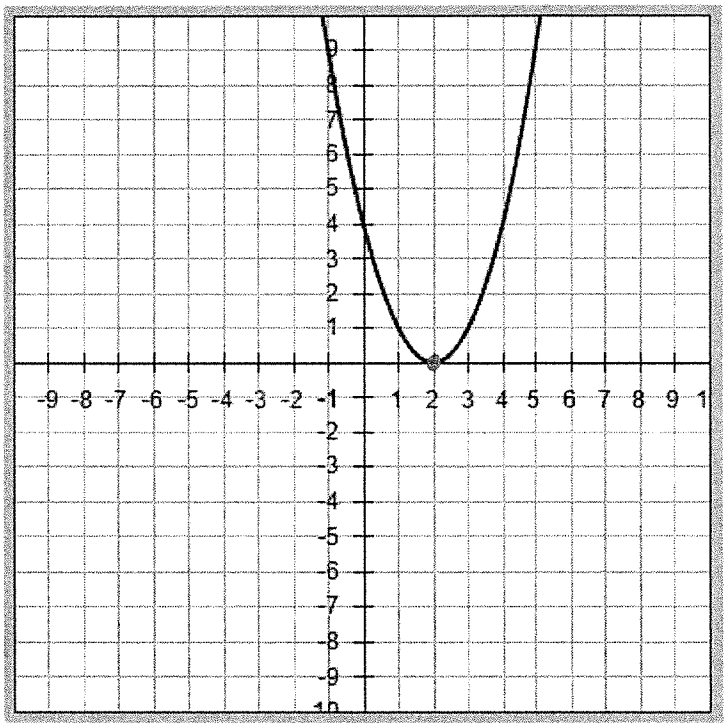


Vertex: (4, -2)

Same or Different

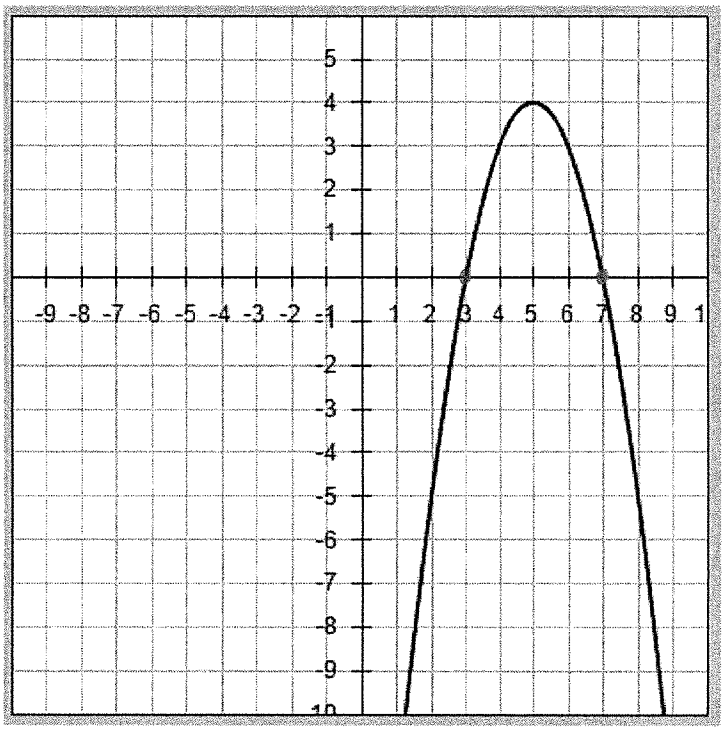
5.) Determine the number of **real number** solutions for the following quadratic function. Show the solutions on the graph. Explain how you know the number of real number solutions.

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



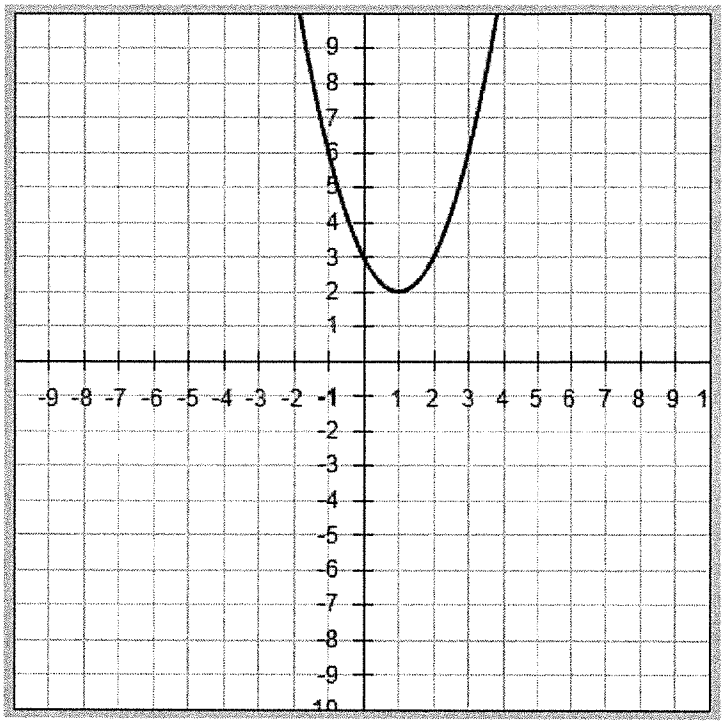
6.) Determine the number of **real number** solutions for the following quadratic function. Show the solutions on the graph. Explain how you know the number of real number solutions.

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



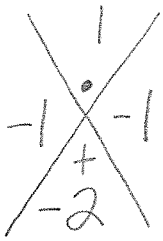
7.) Determine the number of **real number** solutions for the following quadratic function. Show the solutions on the graph. Explain how you know the number of real number solutions.

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 $7x^2 - 14x = -7$ **Show all work! Round answers to the nearest hundredth if necessary.**

$7x^2 - 14x = -7$
$+7 \quad +7$
$7x^2 - 14x + 7 = 0$
GCF = 7
$7(x^2 - 2x + 1) = 0$



	x	-1
x	x^2	$-1x$
-1	$-1x$	1

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

9.) Find the zeros of $10z^2 - 11z - 15 = -8$ **Show all work! Round answers to the nearest hundredth if necessary.**

$10z^2 - 11z - 7 = 0$ $+8$ $+8$

$a = 10$
$b = -11$
$c = -7$

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

$$x = \frac{11 \pm \sqrt{121 - 4 \cdot 10 \cdot -7}}{2 \cdot 10}$$

$$x = \frac{11 \pm \sqrt{401}}{20}$$

$x \approx 1.55$
$x \approx -0.45$

10.) Solve the equation: $c^2 + 12c + 32 = 0$ **Show all work! Round answers to the nearest hundredth if necessary.**

$a = 1$
$b = 12$
$c = 32$

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

$$x = \frac{-12 \pm \sqrt{144 - 4 \cdot 1 \cdot 32}}{2 \cdot 1}$$

$$x = \frac{-12 \pm \sqrt{16}}{2}$$

$$x = \frac{-12 \pm 4}{2}$$

$$x = \frac{-12 + 4}{2}$$

$x = -4$

$$x = \frac{-12 - 4}{2}$$

$x = -8$

$x = -4$
$x = -8$

11.) Solve: $4x^2 - 9x - 18 = 6$ **Show all work! Round answers to the nearest hundredth if necessary.**

$-6 \quad -6$

$4x^2 - 9x - 24 = 0$

$a = 4$

$b = -9$

$c = -24$

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

$$x = \frac{9 \pm \sqrt{81 - 4 \cdot 4 \cdot -24}}{2 \cdot 4}$$

$$x = \frac{9 \pm \sqrt{465}}{8}$$

$x \approx 3.82$

$x \approx -1.57$

12.) Find all the zeros of: $6x^2 + 8x - 25 = -3$ **Show all work! Round answers to the nearest hundredth if necessary.**

$+3 \quad +3$

$6x^2 + 8x - 22 = 0$

$a = 6$

$b = 8$

$c = -22$

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

$$x = \frac{-8 \pm \sqrt{64 - 4 \cdot 6 \cdot -22}}{2 \cdot 6}$$

$$x = \frac{-8 \pm \sqrt{592}}{12}$$

$x \approx 1.36$

$x \approx -2.69$

13.) Find the roots of: $4x^2 - 5x - 3 = 2x^2$ **Show all work! Round answers to nearest hundredth if necessary.**

$-2x^2 \quad -2x^2$

$2x^2 - 5x - 3 = 0$

$a = 2$

$b = -5$

$c = -3$

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

$$x = \frac{5 \pm \sqrt{25 - 4 \cdot 2 \cdot -3}}{2 \cdot 2}$$

$$x = \frac{5 \pm \sqrt{49}}{4}$$

$$x = \frac{5 \pm 7}{4}$$

$$x = \frac{12}{4}$$

$$x = 3$$

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

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

$x = 3$

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

14.) Solve: $4x^2 - 17x + 10 = -5$ **Show all work! Round answers to nearest hundredth if necessary.**

$+5 \quad +5$

$4x^2 - 17x + 15 = 0$

$a = 4$

$b = -17$

$c = 15$

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

$$x = \frac{17 \pm \sqrt{289 - 4 \cdot 4 \cdot 15}}{2 \cdot 4}$$

$$x = \frac{17 \pm \sqrt{49}}{8}$$

$$x = \frac{17 \pm 7}{8}$$

$$x = \frac{17 + 7}{8}$$

$$x = 3$$

$$x = \frac{17 - 7}{8}$$

$$x = 1.25$$

$x = 3$

$x = 1.25$