Name: Key

10.2,9.4 & 9.5 Review

1) Given the equation: $y = -10 + 3x + x^2$

a) Determine the number of solutions. $b^2 - 4ac$ $(3)^2 - 4(1)(-10)$

$9 + 40$

$49$ 2 solutions

b) Find the zeros algebraically using:

**Factoring:**

$y = x^2 + 3x - 10$

$y = (x+5)(x-2)$

$-5, 2$

**Completing the Square:**

$0 =$

$10 = x^2 + 3x$

$2.25 + 10 = x^2 + 3x + 2.25$

$\sqrt{12.25} = \sqrt{(x+1.5)^2}$

$\pm 3.5 = x + 1.5$

$-1.5 \pm 3.5$

$-5, 2$

**Quadratic Formula:**

$$\frac{-(3) \pm \sqrt{(3)^2 - 4(1)(-10)}}{2(1)}$$

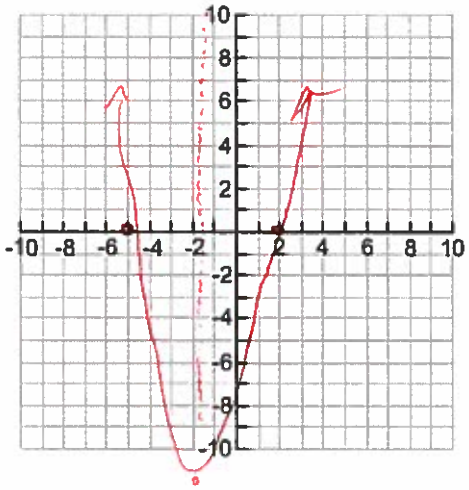
$$\frac{-3 \pm \sqrt{9+40}}{2}$$

$$\frac{-3 \pm \sqrt{49}}{2}$$

$$\frac{-3 \pm 7}{2}$$

$-5, 2$

c) Graph the function using any form.




$y = (x+5)(x-2)$

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

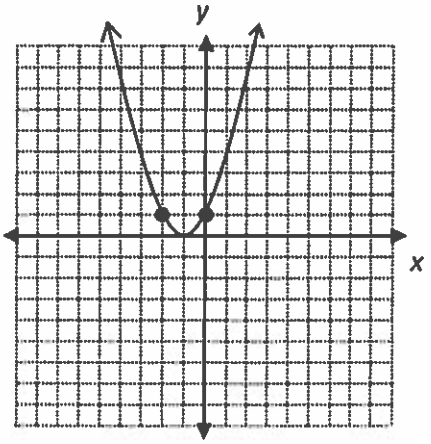
$V = \left(-\frac{3}{2}, -12.25\right)$

d) Describe how parts a-c correlate.

The graph crosses the x-axis twice for 2 solutions.

These x-ints correspond w/ solutions from part b

2) Given the graph. Write as much information you can deduce as possible:




a.o.s is $x = -1$

1 solution; discrim is 0

opens up [a is positive]

c is 1

$(-1, 0)$ is vertex

$-1$ is the root

D: $\mathbb{R}$

R: $y \geq 0$

Translated left 1

3) During World War I, mortars were fired from trenches 3 feet down. The mortars had a velocity of 150 ft/s. Determine how long it will take for the mortar shell to strike its target.

$h = -16t^2 + vt + s$

$0 = -16t^2 + 150t - 3$

$\frac{-(150) \pm \sqrt{(150)^2 - 4(-16)(-3)}}{2(-16)}$

$\frac{-150 \pm \sqrt{22500 - 192}}{-32}$

$\frac{-150 \pm \sqrt{22308}}{-32}$

9.35 and 0.02 unrealistic

4) While performing the quadratic formula a student got the equation down to the following: $x = \frac{-(-6) \pm 10\sqrt{27}}{18}$

**a)** Simplify it and **b)** what are the roots as a decimal (round to the nearest hundredth)?

a) $\frac{6 \pm 30\sqrt{3}}{18} = \frac{2 \pm 10\sqrt{3}}{6} = \frac{1 \pm 5\sqrt{3}}{3}$

b) 3.22 and -2.55

5) Reduce $\sqrt{198}$ (how do you check it?)


$3\sqrt{22}$

Square the outside then multiply by the inside.

6) If there are x-intercepts of the graph of $10x - 5 = -2x^2$, find the exact value(s). (round to the nearest hundredth if necessary)

$\frac{-(-10) \pm \sqrt{(-10)^2 - 4(-2)(5)}}{2(-2)}$

$\frac{10 \pm \sqrt{100 + 40}}{-4}$

.46 and -5.46

7) How many ways can you solve $-3x^2 = -2.43$? Choose one method from the list you made. Solve and check it.

$\frac{-3}{-3} \quad \frac{-2.43}{-3}$

Using Square roots

Factoring

Graphing

$\sqrt{x^2} = \sqrt{.81}$

$x = \pm .9$

8) What is the discriminant of the quadratic equation $y = -5x^2 + 4x - 20$? What does this result tell you?

$(4)^2 - 4(-5)(-20)$

$16 - 400$

$-384$

No solution. The parabola never crosses