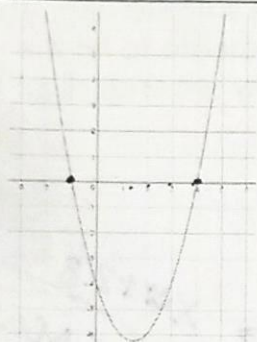


Name: _____

STATION 1: SOLVING BY GRAPHING AND FACTORING

What are the solutions to the following graphs?

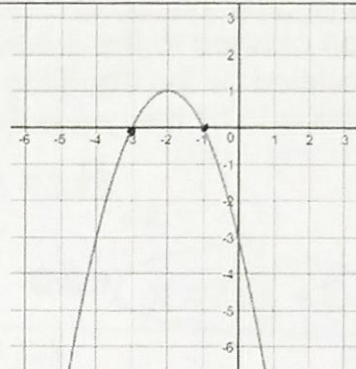
1)



$$x = -1$$

$$x = 4$$

2)

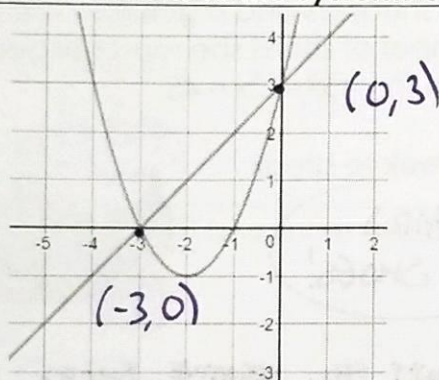


$$x = -3$$

$$x = 1$$

What are the solutions to the systems of equations shown in the graphs below?

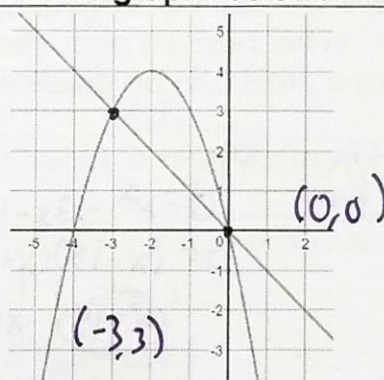
3)



$$(-3, 0)$$

$$(0, 3)$$

4)



$$(-3, 3)$$

$$(0, 0)$$

Use the factor method to find the solutions to the following quadratics

5) $x^2 + 9x + 20 = 0$

$$(x+5)(x+4) = 0$$

$$x = -5$$

$$x = -4$$

6) $x^2 + 3x - 28 = 0$

$$(x+7)(x-4) = 0$$

$$x = -7$$

$$x = 4$$

7) $2x^2 + 13x - 7 = 0$

$$(x + \frac{1}{2})(x - \frac{1}{2}) = 0$$

$$(x+7)(2x-1) = 0$$

$$x = -7 \quad x = \frac{1}{2}$$

$$\frac{14}{1, -4}$$

8) $5x^2 + 13x + 6 = 0$

$$(x + \frac{2}{5})(x + \frac{3}{5}) = 0$$

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

$$x = -2$$

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

9) $x^2 - x = 6$

$$x^2 - x - 6 = 0$$

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

$$x = 3 \quad x = -2$$

10) $x^2 - 9x = 36$

$$x^2 - 9x - 36 = 0$$

$$(x-12)(x+3) = 0$$

$$x = 12$$

$$x = -3$$

Name: _____

STATION 2: APPLICATIONS!

- 1) Lightning hit the top of a cell tower and knocked off the satellite dish. The satellite dish then crashed to the ground. The time it takes for the satellite to hit the ground can be modeled by the equation $h(x) = -16x^2 + 128$. How many seconds did it take for the satellite to hit the ground?

$$0 = -16x^2 + 128$$

$$\frac{-128}{-16} = \frac{-16x^2}{-16}$$

$$8 = x^2$$

$$\sqrt{8} = x$$

$$x = \pm 2.8$$

$x = \text{ABOUT } 2.8 \text{ SECONDS}$

- 2) Cyler is starting her own business selling custom sneakers and is going to the bank for a loan. In her business plan, she predicts the number of shoes she must sell per week to make a profit can be modeled by the equation $f(x) = x^2 - 12x - 45$

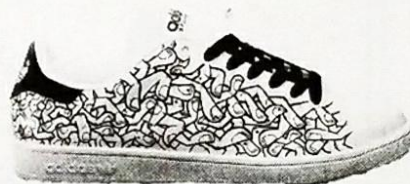
- a) How many pairs of shoes must she sell per week to break even?

$$0 = x^2 - 12x - 45$$

$$0 = (x - 15)(x + 3)$$

$$x = 15 \quad x = -3$$

15 PAIRS OF SHOES!



- b) How many pairs of shoes must she sell per week to make \$175 profit?

$$175 = x^2 - 12x - 45$$

$$-175 \quad -175$$

$$0 = x^2 - 12x - 220$$

$$0 = (x - 22)(x + 10)$$

$$x = 22$$

$$x = -10$$

TO MAKE A PROFIT OF \$175 SHE NEEDS TO SELL 22 PAIRS OF SHOES PER WEEK

- 3) Below is a graph that models a rocket being shot from the top of a raised platform. Where the x axis represents the time in seconds and the y-axis represents the height of the rocket

- a) What is the height of the platform that the rocket is on?

3 FEET

- b) What is the maximum height that the rocket reaches?

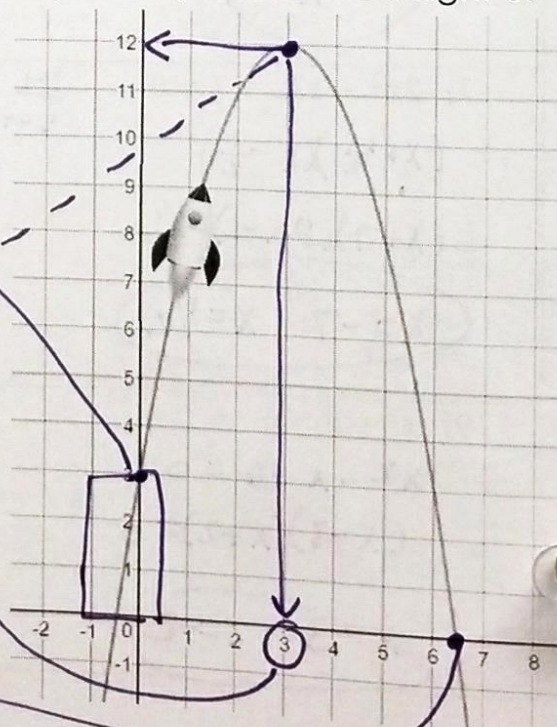
12 FEET

- c) At what TIME does the rocket reach that height?

3 SECONDS

- d) How long does it take for the rocket to hit the ground?

6.5 SECONDS



Name: _____

STATION 3: SOLVING BY SQUARE ROOTS

Use the square root method to solve the following quadratics

1) $4x^2 + 2 = 74$

$-2 \quad -2$

$\frac{4x^2}{4} = \frac{72}{4}$

$x^2 = 18$

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

2) $(x-2)^2 + 4 = 7$

$-4 \quad -4$

$\sqrt{(x-2)^2} = \sqrt{3}$

$x-2 = \pm\sqrt{3}$

$+2 \quad +2$

$x = \pm\sqrt{3} + 2$

3) $2x^2 - 338 = 0$

$+338 \quad +338$

$2x^2 = 338$

$\sqrt{x^2} = \sqrt{169}$

$x = \pm 13$

4) $5(x-4)^2 = 125$

$\frac{5}{5} \quad \frac{125}{5}$
 $\sqrt{(x-4)^2} = \sqrt{25}$

$x-4 = \pm 5$

$+4 \quad +4$

$x = \pm 5 + 4 \rightarrow \text{or } x = 9 \quad x = -1$

5) $0.55x^2 + 550 = 1430$ (give answer as decimals)

$\frac{0.55x^2}{0.55} = \frac{880}{0.55}$

$\sqrt{x^2} = \sqrt{1600}$

$x = \pm 40$

6) $-16x^2 + 1450 = 0$ (give answer as decimals)

$-16x^2 = -1450$

$\sqrt{x^2} = \sqrt{90.625}$

$x = \pm 9.5$

7) $(x+6)^2 - 8 = 24$

$+8 \quad +8$

$\sqrt{(x+6)^2} = \sqrt{32}$

$x+6 = \pm 4\sqrt{2}$

$-6 \quad -6$

$x = \pm 4\sqrt{2} - 6$

8) $3(x+4)^2 - 1 = 5$

$+1 \quad +1$

$\frac{3(x+4)^2}{3} = \frac{6}{3}$

$\sqrt{(x+4)^2} = \sqrt{2}$

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

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

9) $2(x+5)^2 - 5 = 25$

$+5 \quad +5$

$\frac{2(x+5)^2}{2} = \frac{30}{2}$

$\sqrt{(x+5)^2} = \sqrt{15}$

$x+5 = \pm\sqrt{15}$

$-5 \quad -5$

$x = \pm\sqrt{15} - 5$

10) $5x^2 - 67 = 143$

$+67 \quad +67$

$\frac{5x^2}{5} = \frac{210}{5}$

$x^2 = 42$

$x = \pm\sqrt{42}$

Name: _____

STATION 4: SOLVING USING COMPLETING THE SQUARE

Solve the following by completing the square

1) $x^2 - 12x + 26 = 0$

$-26 \quad -26$

$x^2 - 12x = -26$

$x^2 - 12x + 36 = -26 + 36$

$x^2 - 12x + 36 = 10$

$(x-6)^2 = 10$

$x-6 = \pm\sqrt{10}$

$x = \pm\sqrt{10} + 6$

2) $x^2 + 16x - 22 = 14$

$x^2 + 16x = 36$

$x^2 + 16x + 64 = 36 + 64$

$(x+8)^2 = 100$

$x+8 = \pm 10$

$x = \pm 10 - 8$

$x = 18$
 $x = -2$

3) $x^2 - 2x - 48 = -6$

$+48 \quad +48$

$x^2 - 2x = 42$

$x^2 - 2x + 1 = 42 + 1$

$(x-1)^2 = 43$

$x-1 = \pm\sqrt{43}$

$x = \pm\sqrt{43} + 1$

4) $x^2 + 6x - 4 = 0$

$x^2 + 6x = 4$

$x^2 + 6x + 9 = 4 + 9$

$(x+3)^2 = 13$

$x+3 = \pm\sqrt{13}$

$x = \pm\sqrt{13} - 3$

Below is a problem that is solved by completing the square. There is a mistake. Identify the mistake (which step number) and then FIX the problem

$x^2 - 6x - 15 = 20$	Original equation
$x^2 - 6x = 35$	Step 1
$x^2 - 6x - 3 = 35 - 3$	Step 2
$x^2 - 6x - 3 = 32$	Step 3
$(x-3)^2 = 32$	Step 4
$x-3 = \pm 4\sqrt{2}$	Step 5
$x = \pm 4\sqrt{2} + 3$	Step 6

$x^2 - 6x + 9 = 35 + 9$

$(x-3)^2 = 44$

$x-3 = \pm 2\sqrt{11}$

$x = \pm 2\sqrt{11} + 3$

WRONG THING TO ADD