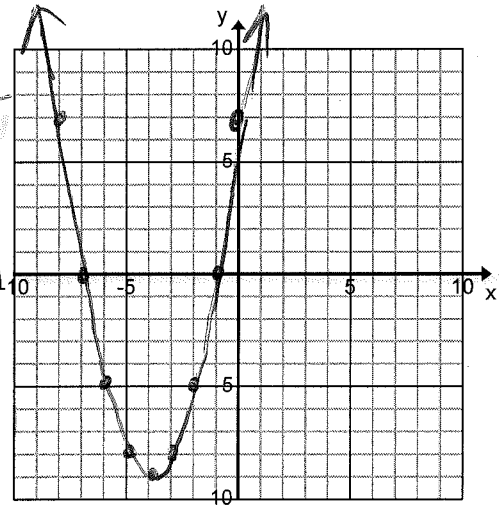
Problems 1 – 4: Solve the equation by Graphing. Show the Graph AND the Solution(s). Round to the nearest hundredth when necessary.

1. $f(x)=x^2+8x+7$, where $f(x)=0$

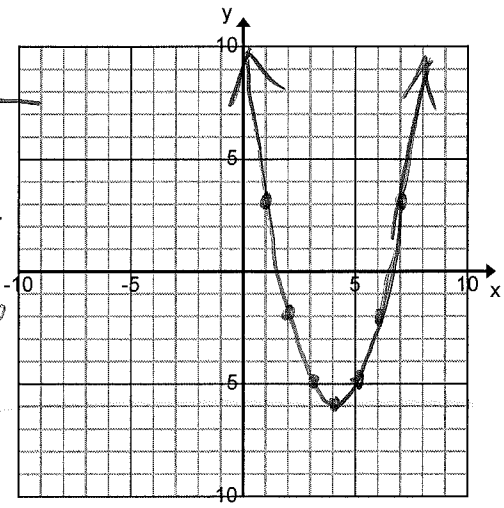
x	y
-7	0
-6	-5
-5	-8
-4	-9
-3	-8
-2	-5
-1	0



Solution(s): $x=-1$ and $x=-7$

2. $h(x)=x^2-8x+10$, where $h(x)=-6$

x	y
1	3
2	-2
3	-5
4	-6
5	-5
6	-2
7	3



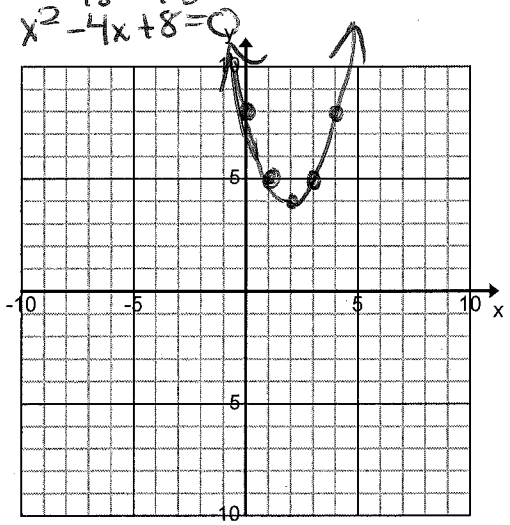
Solution(s): $x=4$

3. $x^2-4x=-8$

$+8 \quad +8$

$x^2-4x+8=0$

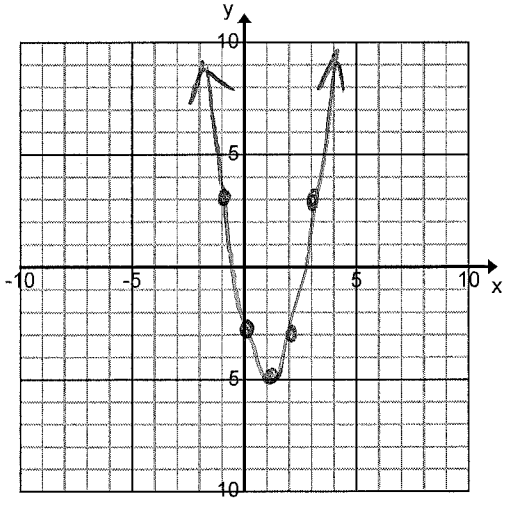
x	y
0	8
1	5
2	4
3	5
4	8



Solution(s): No Real Solution

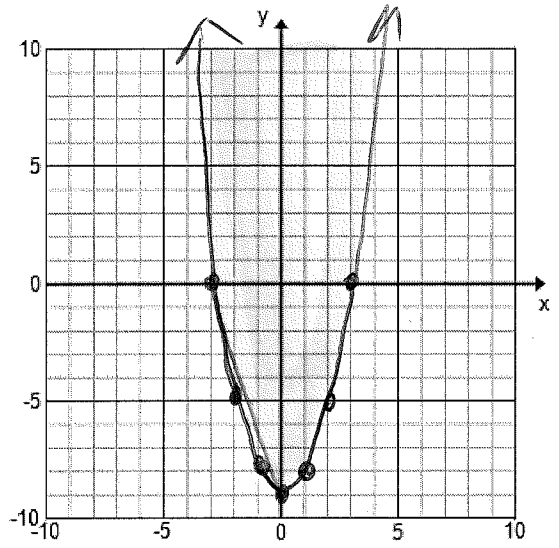
4. $2x^2-4x-3=0$

x	y
-1	3
0	-3
1	-5
2	-3
3	3



Solution(s): $x=-0.58$, $x=2.58$

Problem 5: Graph the inequality. Show a table of values.



5. $y \geq x^2 - 9$

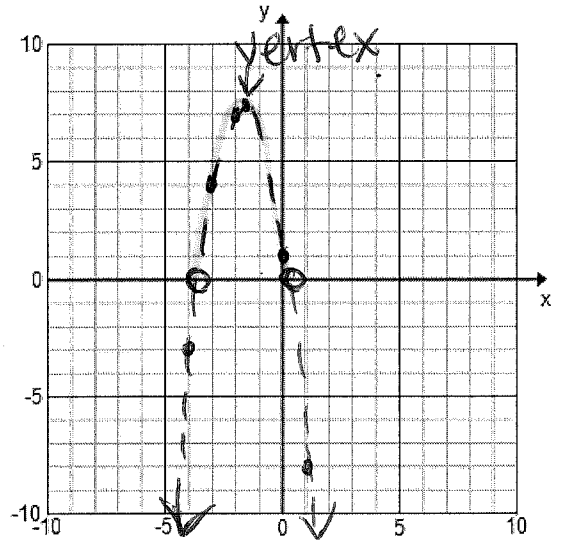
x	y
-3	0
-2	-5
-1	-8
0	-9
1	-8
2	-5
3	0

Test Point: (0,0)

$0 \geq (0)^2 - 9$

$0 \geq -9$ ✓ True Statement

Problem 6: Solve the inequality by graphing. Show the Graph AND the Solution(s). Round to the nearest hundredth when necessary.



6. $0 < -2x^2 - 7x + 1$

$x = -3.64$ and $x = 0.14$

Solution(s): $-3.64 < x < 0.14$

x	y
-4	-3
-3	4
-2	7
-1	6
0	1
1	-8

vertex: (-1.75, 7.13)

Problems 5 – 10: Solve by Factoring. Show the Factors AND the Solution(s).

7. $x^2 + 10x - 24 = 0$

$(x-2)(x+12)=0$

$x-2=0 \quad x+12=0$

$x=2 \quad x=-12$

Factors: $(x-2)(x+12)$

Solution(s): $x=2, x=-12$

8. $4x^2 + 11x - 3 = 0$

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

$4x-1=0 \quad x+3=0$

$+1 \quad +1 \quad x=-3$

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

$x=1/4$

Factors: $(4x-1)(x+3)$

Solution(s): $x=\frac{1}{4}, x=-3$

9. $4x^2 - 25 = 0$

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

$2x-5=0 \quad 2x+5=0$

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

$\frac{2x}{2}=\frac{5}{2} \quad \frac{2x}{2}=\frac{-5}{2}$

$x=5/2 \quad x=-5/2$

Factors: $(2x-5)(2x+5)$

Solution(s): $x=\frac{-5}{2}, x=\frac{5}{2}$

10. $x^2 + 6x + 18 = 9$

$-9 \quad -9$

$x^2+6x+9=0$

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

$x+3=0$

$x=-3$

Factors: $(x+3)(x+3)$ OR $(x+3)^2$

Solution(s): $x=-3$ (Double Root)

11. $6x^2 + 19x = 25$

$-25 \quad -25$

$6x^2+19x-25=0$

$(6x+25)(x-1)=0$

$6x+25=0 \quad (x-1)=0$

$-25 \quad -25 \quad x=1$

$\frac{6x}{6}=\frac{-25}{6} \quad x=\frac{-25}{6}$

Factors: $(x-1)(6x+25)$

Solution(s): $x=1, x=\frac{-25}{6}$

12. $6x^2 + 12x = 0$

$6x(x+2)=0$

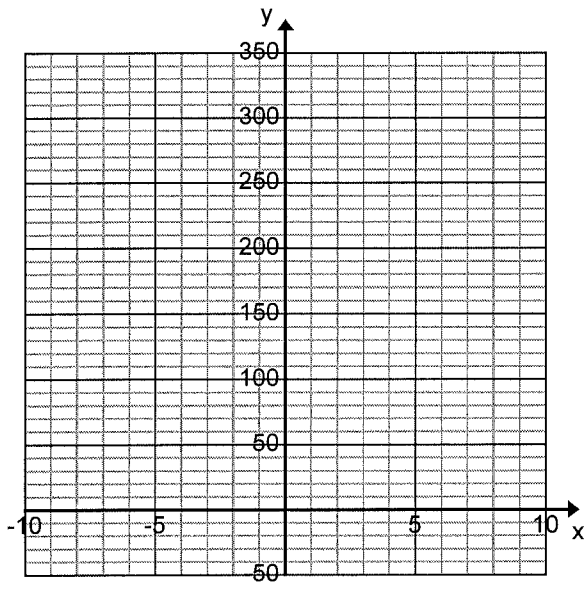
$6x=0 \quad x+2=0$

$x=0 \quad x=-2$

Factors: $(6x)(x+2)$

Solution(s): $x=0 \quad x=-2$

13. A rock is thrown upward from the top of a building. The height of the rock can be calculated using the function $h(t) = -16t^2 + v_0 \cdot t + h_0$ where: v_0 = initial velocity, h_0 = initial height, *h(t)* represents the height of the rock, and *t* represents seconds since the rock was thrown. The building has an initial height of 64 feet and the rock was thrown with an initial velocity of 128 feet per second.



WORK SPACE

a.) Write an equation that models the height of the rock after *t* seconds. Graph this equation and label the scales.

$h(t) = -16t^2 + 128t + 64$

b.) Find the height of the rock after $1\frac{1}{2}$ seconds.

204 ft

c.) What is the maximum height of the rock? After how many seconds does the rock reach this height?

Max height: 320 ft
Reaches height at about 4 seconds

d.) When does the rock have a height of 256 feet off the ground?

$x = 2$ and $x = 6$
at 2 and 6 seconds

e.) When will the rock hit the ground?

$x = 8.47$
at 8.47 seconds