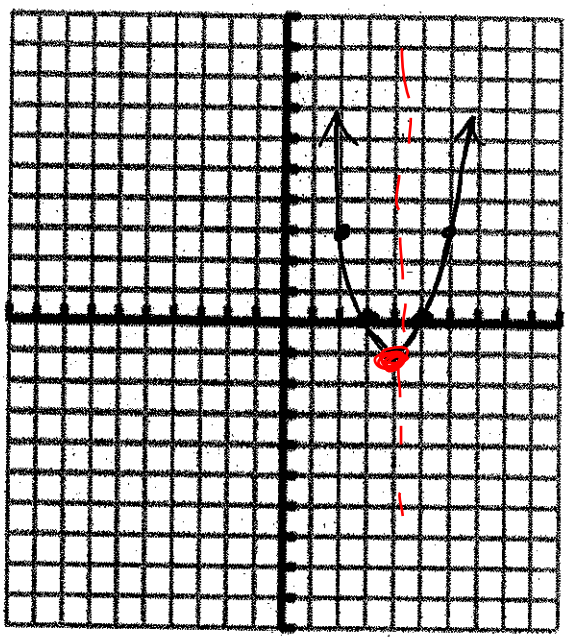
Test: Graphing Quadratic Equations and Inequalities Name_____

1. Fill in the blanks:



Domain: $(-\infty, \infty)$ Range: $[-1, \infty)$

Axis of Symmetry: X= 4 Vertex: $(4, -1)$

Interval of Increase: $(4, \infty)$ Interval of Decrease: $(-\infty, 4)$

Roots/ X-intercepts: ~~(3,0)~~ & $(5, 0)$

Extrema (circle one.....max or min): y= -1

$(4, -1)$

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2. For the equation $y = -x^2 + 4x + 1$ find:

standard

A: -1 B: 4 C: 1

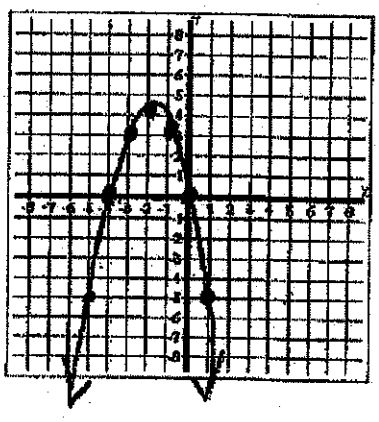
The Axis of Symmetry: $\frac{-b}{2a} = \frac{-(4)}{2(-1)}$ $x = 2$ Opens: Up or Down Vertex: $(2, 5)$

$-(2)^2 + 4(2) + 1 = 5$

Match equation to graph:

a) $y = x^2 - 4$

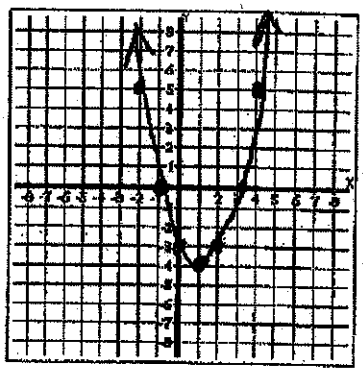
3. Equation C



b) $y = (x-1)^2 - 4$

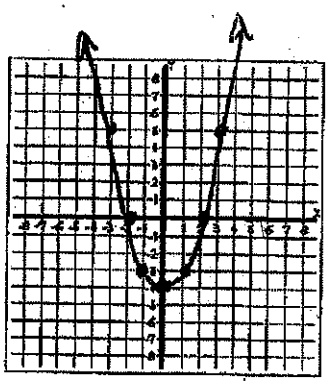
$(1, -4)$

4. Equation B



c) $y = -x^2 - 4x$

5. Equation A



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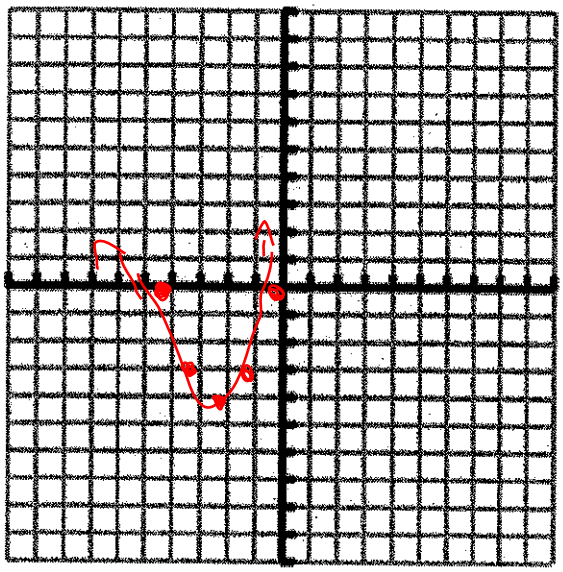
6. Graph the equation in vertex form: $y=(x+2)^2-4$



AOS: -2

Vertex: $-2, -4$

x	y
-4	0
-3	-3
-2	-4
-1	-3

0 0

Opens up or down? up

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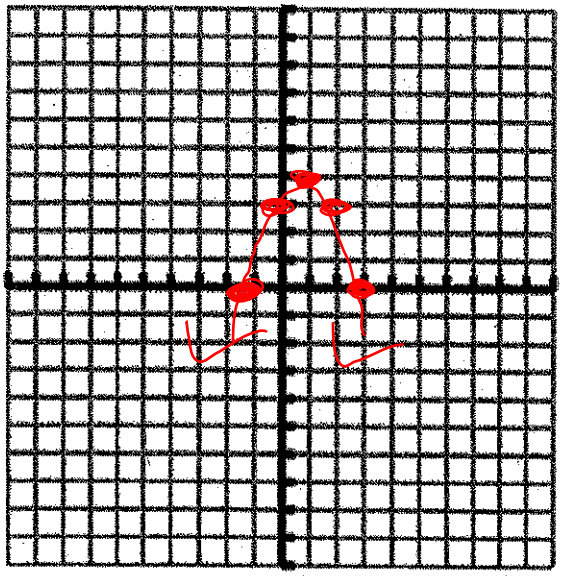
7. Graph the equation in standard form: $y=-x^2+2x+3$

$X=\frac{-(2)}{2(-1)}=1$

$-(1)^2+2(1)+3=(1,4)$ $a=-1\ b=2\ c=3$



AOS: 1

Vertex: $(1,4)$

x	y
-1	0
0	3
1	4
2	3

down

3 0

Opens up or down? _____

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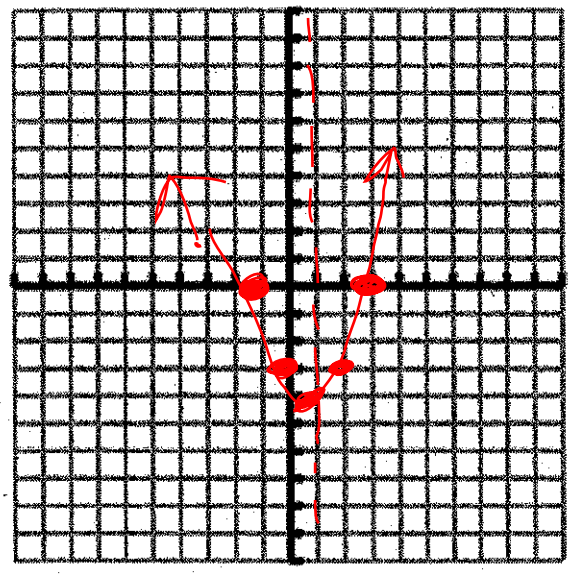
8. Graph the equation in intercept form: y=(x-3)(x+1)

p=3 q=-1



x-intercepts: (3,0) (-1,0)

AOS: $x = \frac{p+q}{2} = \frac{3+-1}{2} = 1$

$y = (1-3)(1+1)$

Vertex: (1,-4)

x	y
-1	0
0	-3
1	-4
2	-3
3	0

Opens up or down? up

Convert the following quadratic equations to the given form.

9. y = (x + 1)(x –5) to standard form

Intercept

$(x+1)(x-5)$

$(x^2-5x+x-5)$ (x^2-4x-5)

10. $y = x^2 - 12x + 15$ to vertex form

Standard

$a=1$

$\frac{-b}{2a}$ $\frac{-(-12)}{2(1)} = 6$ $(6)^2-12(6)+15=-21$

$0(x-6)^2-21$ $y=(x-6)^2-21$

11. $y = x^2 - 5x - 14$ to intercept form

Standard

$-7 \times 2 = -14$ $-7+2=-5$

$y=(x-7)(x+2)$

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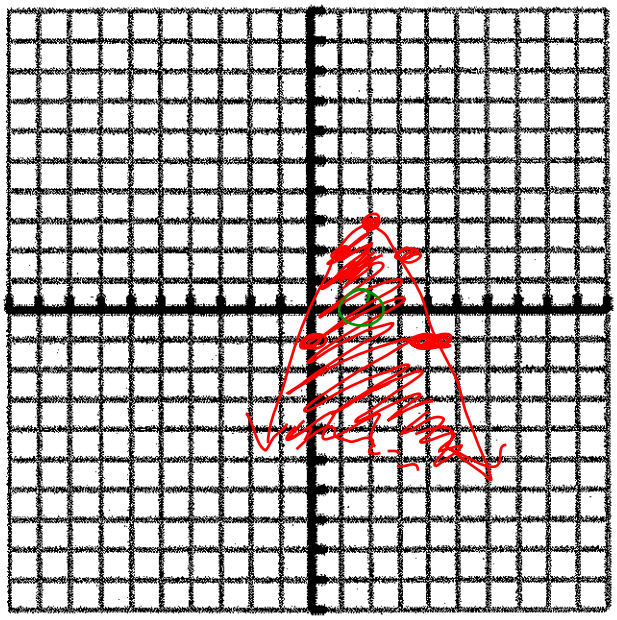
12. a. Graph $y \leq -x^2 + 4x - 1$

$a=-1\ b=4\ c=-1$



AOS: $x = \frac{-b}{2a} = \frac{-(4)}{2(-1)} = 2$

Vertex: (2, 3)

$-(2)^2 + 4(2) - 1 = 3$

x	y
0	-1
1	2
2	3
3	2
4	-1

Opens up or down? down

Dashed or Solid Curve? Solid

Shade up or down? down

(2, 0)

x, y

$0 \leq (2)^2 + 4(2) - 1$

$0 \leq 4 + 8 - 1$

$0 \leq 3$

True

b. Name ONE solution (ordered pair) of the quadratic inequality in #12. (2, -1), (3, -2) lots of others

c. Name ONE ordered pair that is not a solution in #12. (-5, 7)

Solve the following and graph.

13. $x^2 + 2x - 3 \leq 0$

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

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

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

$x=-3 \quad x=1$

3 × −1 = −3, 3 + (−1) = 2

$-3 \leq x \leq 1$

-4: $(-4)^2 + 2(-4) - 3 \leq 0$, $5 \leq 0$, False

0: $0^2 + 2(0) - 3 \leq 0$, $-3 \leq 0$, True

2: $2^2 + 2(2) - 3 \leq 0$, $5 \leq 0$, False

14. $x^2 + 6x + 8 > 0$

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

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

$x+4=0 \quad x+2=0$

$x=-4 \quad x=-2$

4 × 2 = 8, 4 + 2 = 6

$x < -4$ OR $x > -2$

-5: $3 > 0$, True

-3: $(-3)^2 + 6(-3) + 8 > 0$, $-1 > 0$, False

0: $0^2 + 6(0) + 8 > 0$, $8 > 0$, True