Algebra II
Sect. 5-5 & 5-6 Review Name KEY

For the following problems, name the vertex, axis of symmetry and direction of opening, then fill in the blank x/y-chart with the vertex and two other "sensible" sets of coordinates.

1) $y = (x + 12)^2 - 8$

Vertex: $(-12, -8)$

a.o.s.: $x = -12$

up/down: up

x	y
-12	-8
-11 / -13	-7
-10 / -14	-4

2) $y = -2(x - 5)^2 + 11$

Vertex: $(5, 11)$

a.o.s.: $x = 5$

up/down: down

x	y
5	11
4 / 6	9
3 / 7	3

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

Vertex: $(4, -1)$

a.o.s.: $x = 4$

up/down: up

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

For the following problems, first change them into "vertex form", then provide the information requested.

4) $y = x^2 - 14x + 51$

$y = x^2 - 14x + 49 + 51 - 49$

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

Vertex: $(7, 2)$

a.o.s.: $x = 7$

up/down: up

5) $y = -13x^2 - 1$

$y = -13(x + 0)^2 - 1$

Vertex: $(0, -1)$

a.o.s.: $x = 0$

up/down: down

6) $y = x^2 + 2x - 9$

$y = x^2 + 2x + 1 - 9 - 1$

$y = (x + 1)^2 - 10$

Vertex: $(-1, -10)$

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

up/down: up

Write an equation in "vertex form" for the parabola with the given vertex and point.

7) V(-8, 9)
P(-5, -9)

$y = a(x + 8)^2 + 9$
$-9 = a(-5 + 8)^2 + 9$
$-9 = a(3)^2 + 9$
$-9 = 9a + 9$
$-18 = 9a$
$-2 = a$
$y = -2(x + 8)^2 + 9$

8) V(2, -2)
P(3, 3)

$y = a(x - 2)^2 - 2$
$3 = a(3 - 2)^2 - 2$
$3 = a(1)^2 - 2$
$3 = a - 2$
$5 = a$
$y = 5(x - 2)^2 - 2$

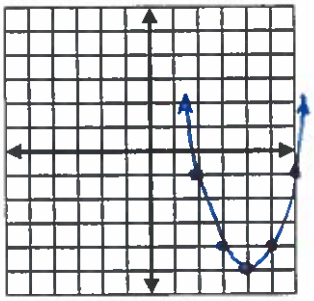
9) V(0, 15)
P(4, 11)

$y = a(x + 0)^2 + 15$
$11 = a(4 + 0)^2 + 15$
$11 = a(4)^2 + 15$
$11 = 16a + 15$
$-4 = 16a$
$-\frac{1}{4} = a$
$y = -\frac{1}{4}x^2 + 15$

Graph the following equations on the grids provided.

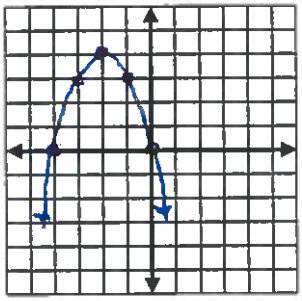
10) $y = (x-4)^2 - 5$

x	y
4	-5
5	-4
6	-1



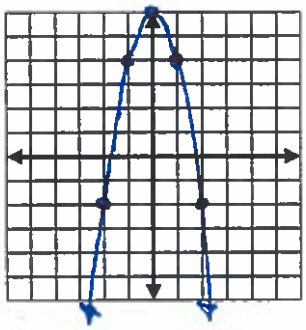
11) $y = -(x+2)^2 + 4$

x	y
-2	4
-1	3
0	0



12) $y = -2x^2 + 6$

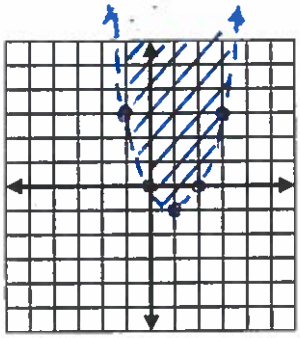
x	y
0	6
1	4
2	-2



Graph the inequalities. Remember, same as 10-12, but shaded with dashed or solid lines!

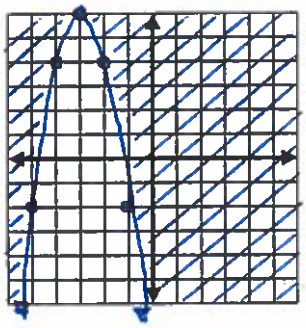
13) $y > (x-1)^2 - 1$

x	y
1	-1
2	0
3	3



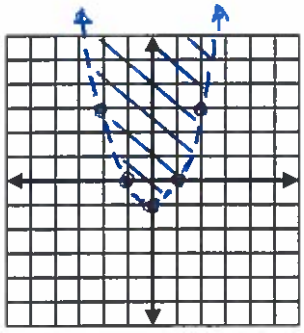
14) $y \geq -2(x+3)^2 + 6$

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



15) $y < x^2 - 1$

x	y
0	-1
1	0
2	3



Change this last problem to "vertex form" first, then graph it.

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

$y = x^2 - 4x + 4 - 2 - 4$

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

x	y
2	-6
3	-5
4	-2