Acc. Pre-Calculus
Unit 6 Conics
WS-2: Parabolas

Name: _____

Date: _____ Block: ___

Students will recognize, analyze and graph the equations of the conic sections.

I. For each parabola, write the equation in standard form, state the vertex, the focus and the directrix and then graph.

1. $x^2 - 8y = 0$ $x^2 = 8y$ v: (0,0) f: (0,2) dir: $y = -2$
   $4p = 8$, $p = 2$

2. $(x-2)^2 = 8(y+1)$ v: (2,-1) f: (2,1) dir: $y = -3$
   $4p = 8$, $p = 2$

3. $(y+2)^2 = -16(x-3)$ v: (3,-2) f: (-1,-2) dir: $x = 7$
   $-16 = -4p$, $p = -4$

4. $(x+1)^2 + 8(y+2) = 0$ v: (-1,-2) f: (-1,-4) dir: $y = 0$
   $(x+1)^2 = -8(y+2)$, $-4p = -8$, $p = -2$

5. $(x+3) + (y-2)^2 = 0$ v: (-3,2) f: $(-3\frac{1}{4}, 2)$ dir: $x = -2\frac{3}{4}$
   $(y-2)^2 = -(x+3)$, $-4p = -1$, $p = -\frac{1}{4}$

6. ~~$x^2 - 2x - 12y + 13 = 0$~~ v: (-4,2) f: (-4,1) dir: $y = 3$
   $x^2 + 8x = -4y - 8$
   $(x+4)^2 = -4(y-2)$

7. $-4x + 4 = y^2 + 10y + 25$ v: (1,-5) f: (0,-5) dir: $x = 2$
   $(y+5)^2 = -4(x-1)$
   $p = -1$

8. $x^2 - 2x - 12y + 13 = 0$ v: (1,1) f: (1,4) dir: $y = -2$
   $x^2 - 2x$ =
   $(x-1)^2 = 12(y-1)$

9. $4x^2 - 40y - 24x - 4 = 0$ v: (3,-1) f: $(3, 1\frac{1}{2})$ dir: $y = -3\frac{1}{2}$
   $x^2 - 6x$ $= 10y + 1$
   $(x-3)^2 = 10(y+1)$ $4p = 10$, $p = \frac{5}{2}$

10. $2x^2 - 16x + 16y + 64 = 0$ v: (4,-2) f: (4,-4) dir: $y = 0$
    $x^2 - 8x = -8y - 32 + 16$
    $(x-4)^2 = -8(y+2)$
    $4p = -8$
    $p = -2$

II. Given the following information, write the standard form for each parabola.

11. Vertex: (3, 2); focus: (1, 2) $(y-2)^2 = -8(x-3)$

p = -2

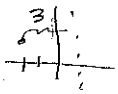
Hori Left

12. Vertex: (3, 2); focus: (-1, 2) $(y-2)^2 = -16(x-3)$

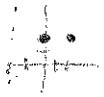
p = -4

13. Vertex: (0, 4); directrix: y = 2 $x^2 = 8(y-4)$

14. Vertex: (-2, 1); directrix: x = 1 $(y-1)^2 = -12(x+2)$



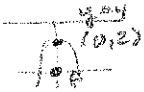
15. Focus: (2, 2); directrix: x = -2 $(y-2)^2 = 8x$



V: (0,2)

p = 2

16. Focus: (0, 0); directrix: y = 4 $(x)^2 = -8(y-2)$



17. Vertex: (0, 0); focus: (0, -2) $x^2 = -8y$

18. Vertex: (0, 0); directrix: x = 3 $y^2 = -12x$

19. Focus: (2, 5); directrix: x = 3 $(y-5)^2 = -2(x-2\frac{1}{2})$

20. Focus: (1, 3); vertex: (1, 2) $(x-1)^2 = 4(y-2)$

① $x^2 = 8y$

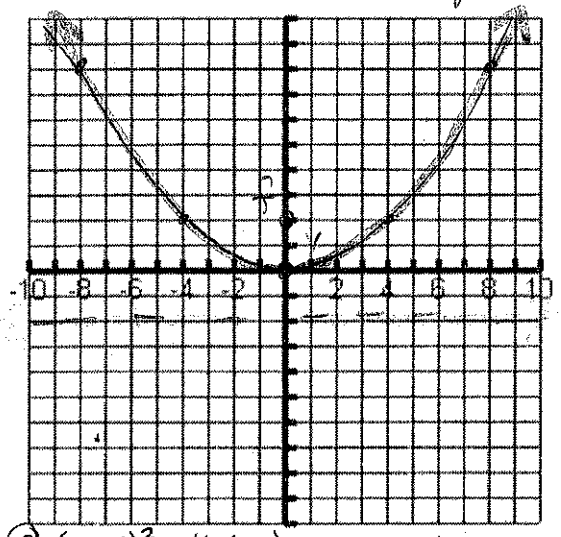
$4p = 8$

$p = 2$

vertex: (0,0)

focus: (0,2)

dir: $y = -2$



② $(x-2)^2 = 8(y+1)$

V: (2,-1)

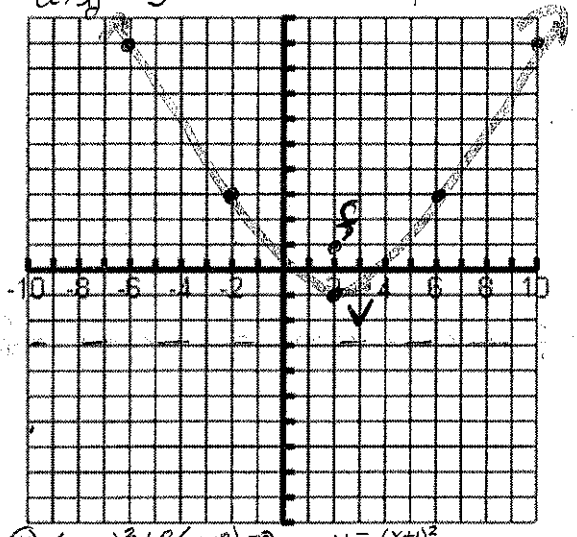
f: (2,1)

d: $y = -3$

$p = 2$

$y = \frac{(x-2)^2}{8} + 1$

10	9
-6	9
6	3



③ $(y+2)^2 = -16(x-3)$

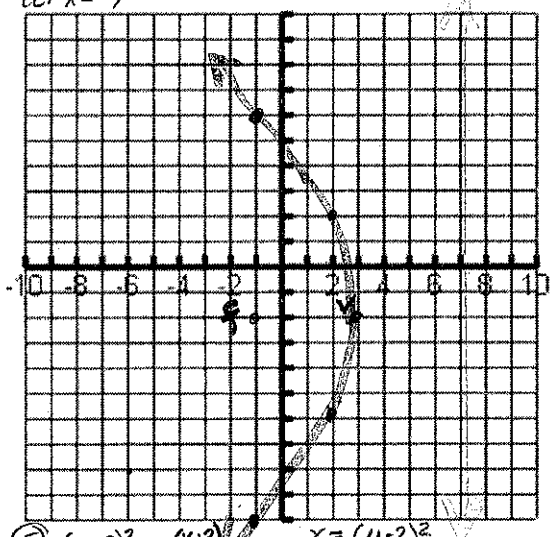
V: (3,-2)

f: (-1,-2)

d: $x = 7$

$x = \frac{(y+2)^2}{-16} + 3$

-1	6
2	2



④ $(x+1)^2 + 8(y+2) = 0$

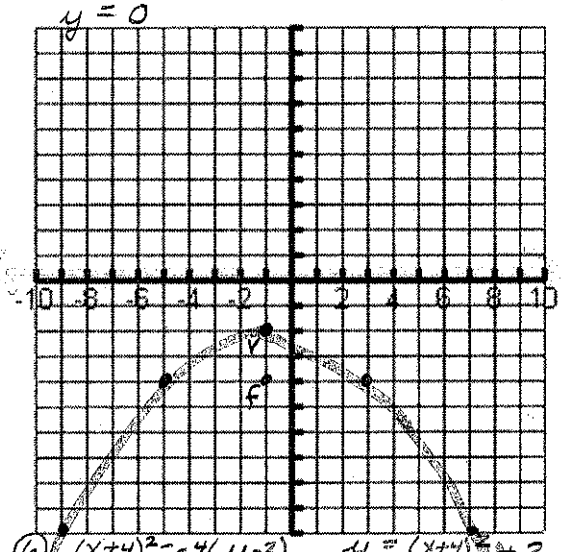
V: (-1,-2)

f: (-1,-4)

$y = 0$

$y = \frac{(x+1)^2}{-8} - 2$

7	-10



⑤ $(y-2)^2 = -(x+3)$

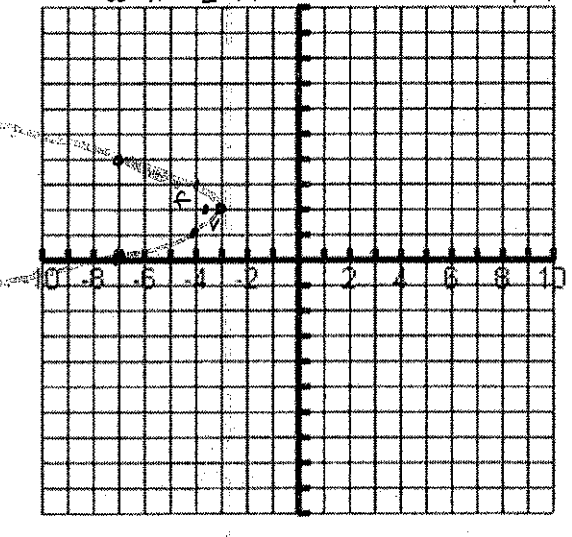
V: (-3,2)

f: $(-3\frac{1}{4}, 2)$

d: $x = -2\frac{3}{4}$

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

-4	3
-4	1
-7	0
-7	4



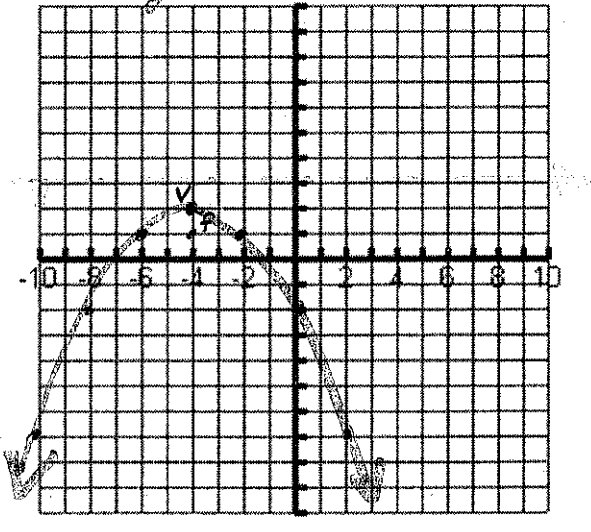
⑥ $(x+4)^2 = -4(y-2)$

V: (-4,2)

f: (-4,1)

d: $y = 3$

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

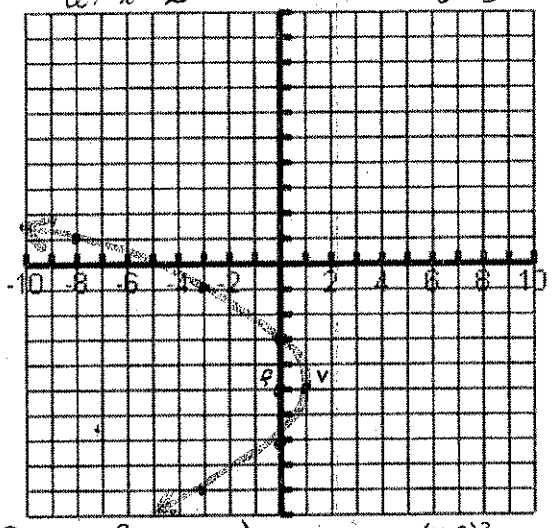


⑦ $(y+5)^2 = -4(x-1)$

V: (1, -5)
f: (0, -5)
d: $x = 2$

$x = \frac{(y+5)^2}{-4} + 1$

-3	-1
-3	-9
0	-3

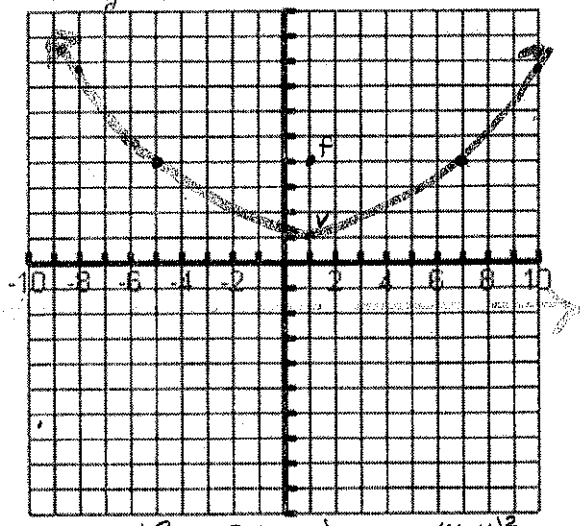


⑧ $(x-1)^2 = 12(y-1)$

V: (1, 1)
f: (1, 4)
d: $y = -2$

$y = \frac{(x-1)^2}{12} + 1$

-5	4

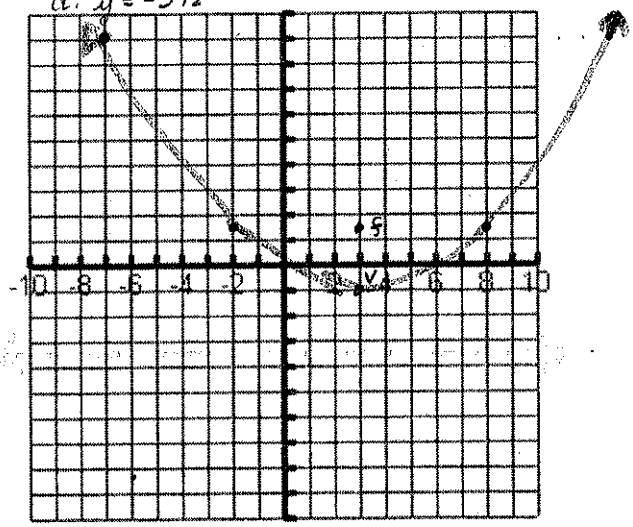


⑨ $(x-3)^2 = 10(y+1)$

V: (3, -1)
f: (3, 1½)
d: $y = -3\frac{1}{2}$

$y = \frac{(x-3)^2}{10} - 1$

13	9



⑩ $(x-4)^2 = -8(y+2)$

V: (4, -2)
f: (4, -4)
d: $y = 0$

$y = \frac{(x-4)^2}{-8} - 2$

-4	-10
0	-4