

Intro Precalculus: 8.2 Parabolas Homework

Name _____

#1 - 4: Which type of parabola: Vertical or Horizontal?

1) $y^2 = 4x$

Horizontal

2) $x^2 = 4y$

Vertical

3) $y = (x - 2)^2 + 3$

Vertical

4) $x = 3(y - 8)^2 - 4$

Horizontal

#5 - 8: Graph each parabola. Include the vertex, focus, and directrix.

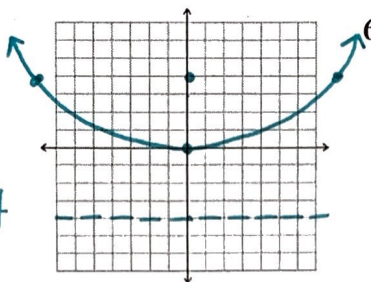
5) $y = \frac{1}{16}x^2$

Vertex: (0,0)

Focal Length (p): 4

Focus: (0,4)

Directrix: $y = -4$



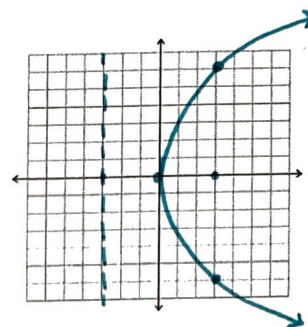
6) $x = \frac{1}{12}y^2$

Vertex: (0,0)

Focal Length (p): 3

Focus: (3,0)

Directrix: $x = -3$



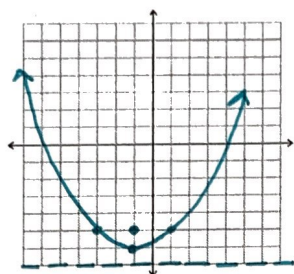
7) $y = \frac{1}{4}(x + 1)^2 - 6$

Vertex: (-1,-6)

Focal Length (p): 1

Focus: (-1,-5)

Directrix: $y = -7$



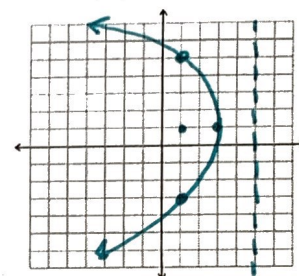
8) $x = -\frac{1}{8}(y - 1)^2 + 3$

Vertex: (3,1)

Focal Length (p): 2

Focus: (1,1)

Directrix: $x = 5$



#9 - 12: Find the vertex, focus, and directrix of each parabola. Then match equation to its graph.

9) $(y - 1)^2 = 4(x - 1)$ C

Vertex: (1,1) Focus: (2,1) Directrix: $x = 0$

10) $(x + 1)^2 = 4(y + 1)$ A

Vertex: (-1,-1) Focus: (-1,0) Directrix: $y = -2$

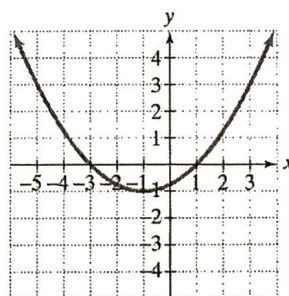
11) $(x + 1)^2 = -4(y + 1)$ D

Vertex: (-1,-1) Focus: (-1,-2) Directrix: $y = 0$

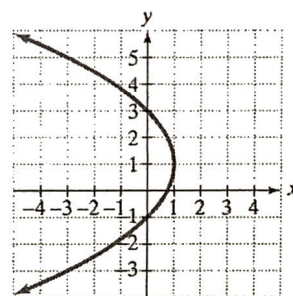
12) $(y - 1)^2 = -4(x - 1)$ B

Vertex: (1,1) Focus: (0,1) Directrix: $x = 2$

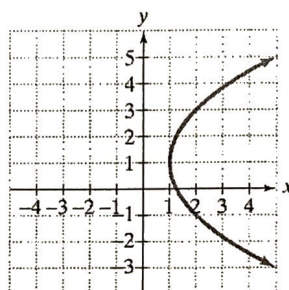
a.



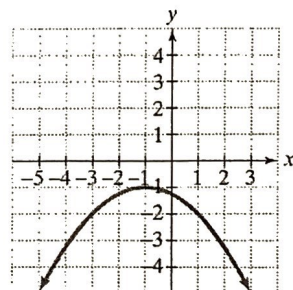
b.



c.



d.



#13 – 16: Convert each equation to standard form by completing the square on x or y .

13) $x^2 - 2x - 4y + 9 = 0$

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

OR

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

14) $y^2 - 2y + 12x - 35 = 0$

$$(y-1)^2 = -12(x-3)$$

OR

$$x = -\frac{1}{12}(y-1)^2 + 3$$

15) $x^2 + 6x + 8y + 1 = 0$

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

OR

$$y = -\frac{1}{8}(x+3)^2 + 1$$

16) $x^2 + 8x - 4y + 8 = 0$

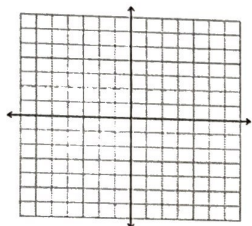
$$(x+4)^2 = 4(y+2)$$

OR

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

#17 – 20: Find the standard form of the equation of each parabola satisfying the given conditions.

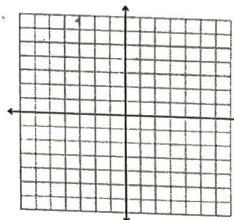
17) Focus: $(7,0)$; Directrix: $x = -7$



$p=7$
vertex: $(0,0)$

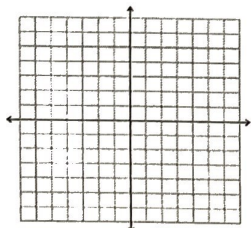
$$x = \frac{1}{28}y^2$$

18) Vertex: $(2,-3)$; Focus: $(2,-5)$



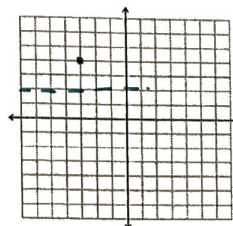
$$y = -\frac{1}{8}(x-2)^2 - 3$$

19) Focus: $(3,2)$; Directrix: $x = -1$



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

20) Vertex: $(-3,4)$; Directrix: $y = 2$



$$y = \frac{1}{8}(x+3)^2 + 4$$