

10.2 Parabolas

Writing Equations & Review

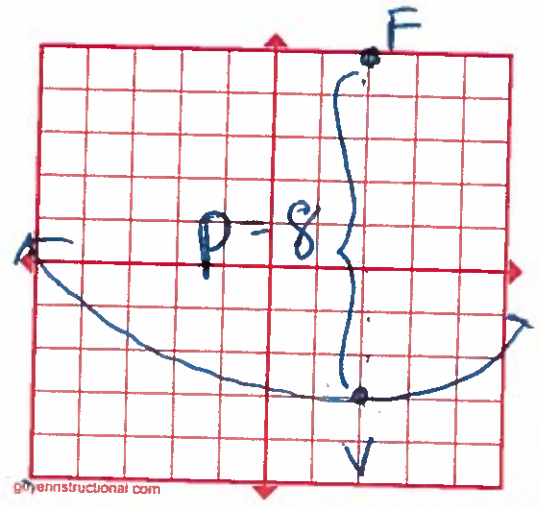
① vertex: (h, k)

Focus: $(2, 5)$

opens up or down

$$y = a(x-h)^2 + k$$

$$y = \frac{1}{32}(x-2)^2 + -3$$



$$p = \frac{1}{4} \cdot \frac{1}{a}$$

~~$$8 = \frac{1}{4a}$$~~

$$p = \frac{1}{4a}$$

~~$$\frac{1}{32} = \frac{1}{4a}$$~~

~~$$\frac{1}{32} = \frac{32}{32} \cdot \frac{1}{4a}$$~~

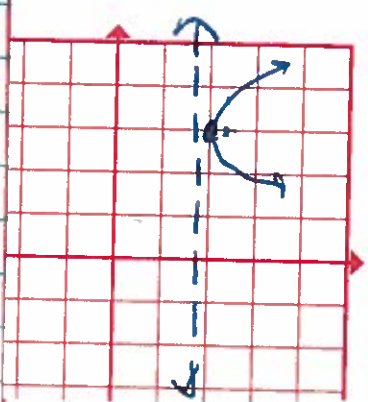
② vertex (h, k)

directrix $x = 1\frac{3}{4}$

opens right & left

$$x = a(y-k)^2 + h$$

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



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

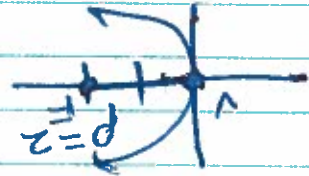
$$2 - 1\frac{3}{4}$$

~~$$\frac{1}{4} = \frac{1}{4a}$$~~

$$\frac{4a}{4} = \frac{4}{4}$$

$$a = 1$$

$$X = \frac{1}{4} Y^2$$

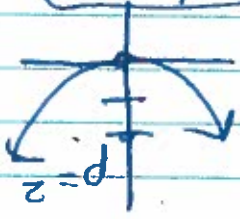


$$\frac{1}{4} = \frac{1}{4a}$$

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

$$p = \frac{1}{4a}$$

$$Y = \frac{1}{8} X^2$$



Ex 4

Focus: $(a, 0)$
Vertex: $(0, 0)$ **OK**

Focus: $(0, 2)$
Vertex: $(0, 0)$

Vertex $(0, 0)$ or $X = aY^2$ or $Y = aX^2$

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

$$X = a(y-k)^2 + h$$

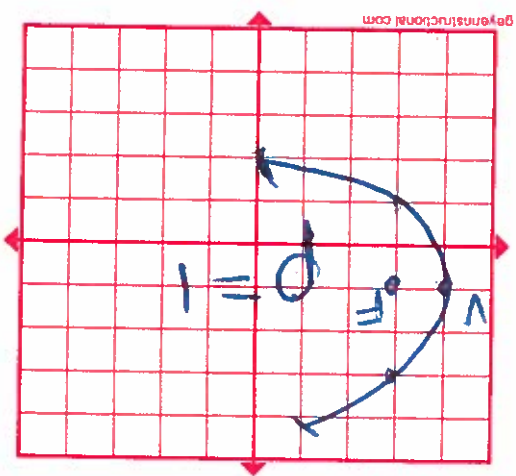
Opens L + R

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

$$p = \frac{1}{4a}$$

Vertex: $(-4, 1)$
Focus: $(-3, 1)$

h k



geogebra.com

10.2 #3

Parabolas Review

(1-4) Write the equation in standard form. Circle your answers.

1. $x^2 - 4y = 0$

2. $x^2 - 8x - y + 19 = 0$

3. $y^2 - 2x - 4y = -10$

4. $x - \frac{1}{20}y^2 = 0$

(5-8) Decide whether the parabola has a horizontal or vertical axis. Find the vertex, focus, directrix and axis of symmetry.

5. $y = 4x^2$

6. $x = -\frac{1}{6}y^2$

axis: _____
 vertex: _____
 Focus: _____
 Directrix: _____
 Axis of Sym.: _____

axis: _____
 vertex: _____
 Focus: _____
 Directrix: _____
 Axis of Sym.: _____

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

8. $x = 2(y+3)^2 - 7$

axis: _____
 vertex: _____
 Focus: _____
 Directrix: _____
 Axis of Sym.: _____

axis: _____
 vertex: _____
 Focus: _____
 Directrix: _____
 Axis of Sym.: _____

(9-10) Find the equation of the parabola with a vertex at the origin and the given focus.

9. (8,0) _____

10. (0,-2) _____

Write the equation of the parabola with the given vertex and focus.

11. Vertex: (1,-2)

Focus: (1,1)

12. Vertex: (3,-2)

Focus: (5,-2)

13. Vertex: (2,5)

Focus: (2,-3)

14. Vertex: (1,-3)

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