

Example 2 Parabolas p. 3 Ch 11

$$5x + 3y^2 = 0$$

- 1st separate the squared variable & first degree variable using algebra

$$3y^2 + 5x - 5x = 0 - 5x$$

$$3y^2 = -5x$$

- Make the numeric coefficient of the squared variable one

$$3y^2 \div 3 = -5x \div 3$$

- Simplify

$$y^2 = -\frac{5}{3}x$$

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- Find p. You know that the coefficient of y is 4p, so use algebra

$$4p = -\frac{5}{3}$$

So,

$$4p \div 4 = -\frac{5}{3} \div 4$$

Therefore,

$$p = -\frac{5}{3} \cdot \frac{1}{4} = -\frac{5}{12}$$

a) Find the Focus (p, 0)

- Use p to give the focus. For a left/right facing parabola the focus will be (p, 0).

$$F(-5/12, 0)$$

b) Find Directrix

- Since this is an left facing parabola (what we would once have looked at as $x = ay^2$) this is a vertical line p units to the right of the vertex, which is $(0, 0)$ in this case

$$x = \frac{5}{12}$$

c) Find the focal diameter

- The focal diameter is 4 times p 's distance (that means absolute value is used) or 2 times p 's distance on either side of the focus

$$|4 \cdot -5/12| = 5/3$$

and $|2 \cdot -5/12| = 5/6$ which is more helpful in finding
2 more points on the parabola

$(-5/12, 5/6)$ & $(-5/12, -5/6)$ are the points on the parabola equidistant from the
focus

d) Sketch the graph

- 1st Place the vertex
- 2nd Place the directrix
- 3rd Place the 2 points on the focal diameter
- 4th Draw the parabola

