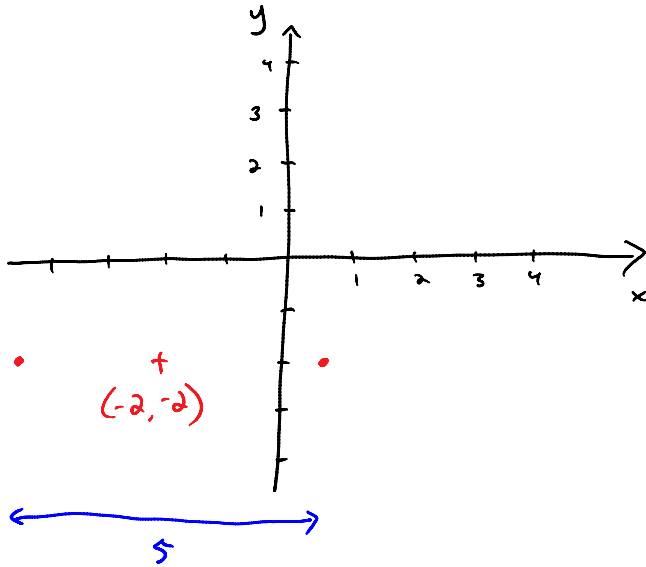


Section 10.3: cont'd

Monday, March 14, 2016
9:51 AM

example: Find the equation of the hyperbola with foci $(\frac{1}{2}, -2)$ and $(-4\frac{1}{2}, -2)$ and with eccentricity $\frac{1}{4}$.



$$(h, k) = (-2, -2)$$

$$c = 5/2$$

$$e = \frac{5}{4} = \frac{c}{a}$$

$$a = \frac{c}{e} = \frac{5/2}{5/4}$$

$$= \frac{5}{2} \cdot \frac{4}{5} = 2$$

$$a = 2$$

$$b = ?$$

$$c = 5/2$$

$$a^2 + b^2 = c^2$$

$$4 + b^2 = \frac{25}{4}$$

$$b^2 = \frac{25}{4} - \frac{16}{4} = \frac{9}{4}$$

$$b = \frac{3}{2}$$

$$\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$$

$$\frac{(x+2)^2}{4} - \frac{(y+2)^2}{9/4} = 1$$

$$\frac{(x+2)^2}{4} - \frac{4(y+2)^2}{9} = 1$$

which conic section?

a) $16y^2 - x^2 + 2x + 64y + 47 = 0$

- hyperbola

(x^2 and y^2 terms have opposite signs)

b) $x^2 + y^2 - 2x + 6y + 1 = 0$

- circle

(x^2 and y^2 terms have same positive coeff)

c) $y^2 + y - x - 4 = 0$

- parabola

(only one squared term)

d) $x^2 + 2y^2 - 10x + 8y + 29 = 0$

- ellipse

(x^2 and y^2 terms both same sign ~~positive~~ but have different coeffs)

note: if you needed to find a , b , and c or p or r and/or h/k

\Rightarrow then complete the square (at least once)