Quiz 20

April 21, 2017

Show all work and circle your final answer.

Find the vertices, foci, and asymptotes of the hyperbola

$$4x^2 - 9y^2 = 36,$$

then sketch.

A hyperbola of the form $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ has vertices $(\pm a, 0)$, foci $(\pm c, 0)$ where $c^2 = a^2 + b^2$, and asymptotes $y = \pm \frac{b}{a} x$.

$$\frac{4x^2}{36} - \frac{9y^2}{36} = \frac{36}{36}$$

$$\frac{x^2}{9} - \frac{y^2}{4} = 1, \quad \text{so} \quad a = 3, \, b = 2, \, c = \sqrt{9+4} = \sqrt{13}$$

vertices: $(\pm 3, 0)$
foci: $(\pm\sqrt{13}, 0)$
asymptotes: $y = \pm \frac{2}{3} x$