

Answer on Question #45116 – Math – Analytic Geometry

Task:

Find the vertices and foci of the hyperbola with equation x^2 squared over sixteen minus y^2 squared over forty eight = 1

Solution:

$$\frac{x^2}{16} - \frac{y^2}{48} = 1$$

Write the standard form of a hyperbola with horizontal transverse axis. The standard form of a hyperbola with horizontal transverse axis is:

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$$

Compare with the standard form and find a and b. $a=4, b=4\sqrt{3}$.

Substitute for a and b in the equation $c^2 = a^2 + b^2 = 64$, so $c=8$.

The foci of the standard form of a hyperbola are $(\pm c, 0)$, so we have the foci of the hyperbola are $(8,0)$ and $(-8,0)$.

The vertices of the standard form of the hyperbola are $(a, 0)$ and $(-a, 0)$. The vertices of the hyperbola are $(4, 0)$ and $(-4, 0)$.