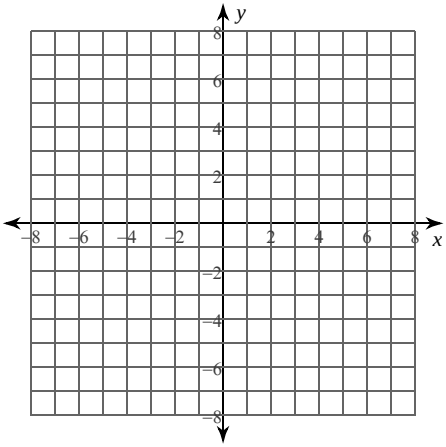
Name_____

Hyperbolas

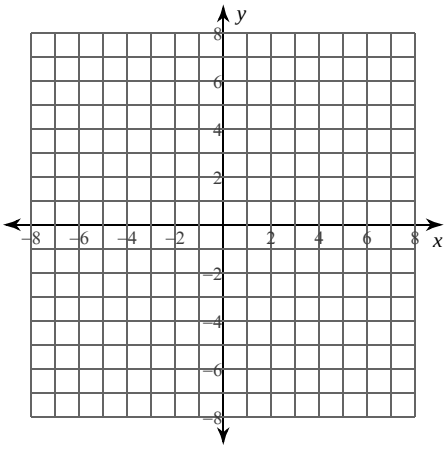
Date_____ Period____

Identify the vertices, foci, and asymptotes of each. Then sketch the graph.

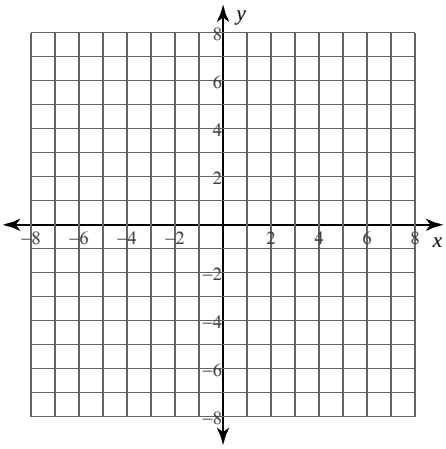
1) $\frac{x^2}{9} - \frac{y^2}{25} = 1$



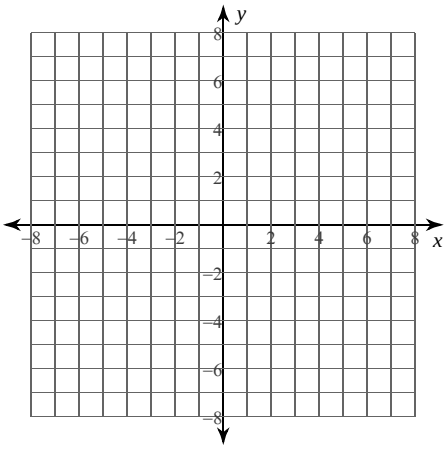
2) $(y+4)^2 - (x-3)^2 = 1$



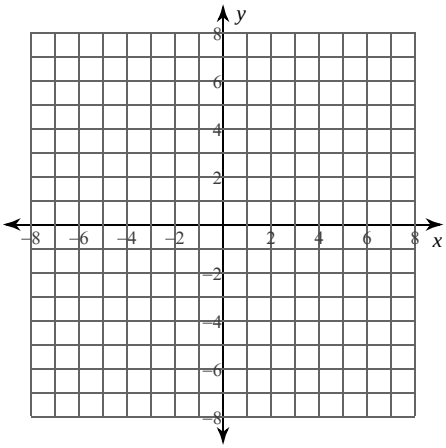
3) $\frac{y^2}{16} - (x+4)^2 = 1$



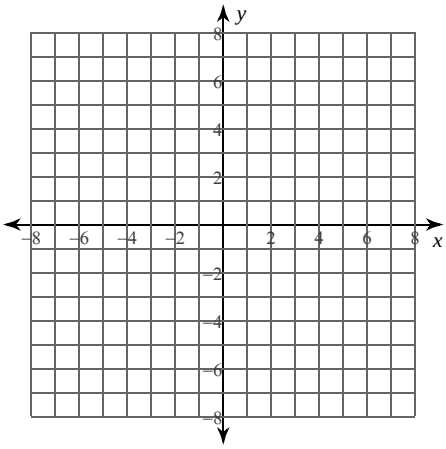
4) $\frac{y^2}{10} - \frac{(x-1)^2}{10} = 1$



5) $9x^2 - 4y^2 - 18x + 16y - 43 = 0$



6) $-9x^2 - 32y = -16y^2 + 128$



Identify the vertices, foci, asymptotes, direction of opening, length of the transverse axis, length of the conjugate axis, length of the latus rectum, and eccentricity of each.

7) $x^2 - y^2 - 6x + 16y - 119 = 0$

8) $-4x^2 + y^2 + 8x - 20y - 4 = 0$

Use the information provided to write the standard form equation of each hyperbola.

9) Vertices: $\left(1 + 3\sqrt{15}, -7\right), \left(1 - 3\sqrt{15}, -7\right)$
Endpoints of Conjugate Axis: $\left(1, -7 + 5\sqrt{5}\right)$
$\left(1, -7 - 5\sqrt{5}\right)$

10) Vertices: $(19, 2), (1, 2)$
Foci: $\left(10 + \sqrt{130}, 2\right), \left(10 - \sqrt{130}, 2\right)$

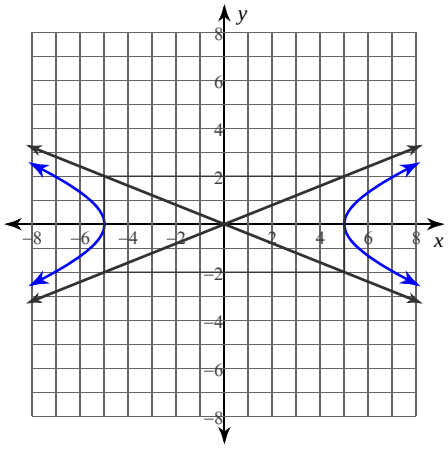
11) Vertices: $(-10, 1), (-10, -17)$
Perimeter of Central Rectangle = 76

12) Vertices: $(7, -2), (5, -2)$
Asymptotes: $y = 11x - 68$
$y = -11x + 64$

13) Center at $(10, -4)$
Transverse axis is vertical and 18 units long
Conjugate axis is 10 units long

14) Foci: $\left(6, 1 + 2\sqrt{58}\right), \left(6, 1 - 2\sqrt{58}\right)$
Points on the hyperbola are 28 units closer to one focus than the other

15)



16) Center at $(-6, 9)$
Vertex at $(-18, 9)$
Eccentricity $= \dfrac{5}{4}$