

Hyperbolas Practice

Identify the center, vertices, foci, and direction of opening of each hyperbola.

1. $\frac{x^2}{81} - \frac{y^2}{4} = 1$ L + R

center: (0,0)

vertices: (9,0) (-9,0)

foci: ($\sqrt{85}$,0) ($-\sqrt{85}$,0)

2. $\frac{y^2}{9} - \frac{x^2}{16} = 1$ U + D

center: (0,0)

vertices: (0,3) (0,-3)

foci: (0,5) (0,-5)

3. $\frac{(x+2)^2}{25} - \frac{(y+8)^2}{4} = 1$ L + R

center: (-2,-8)

vertices: (-7,-8) (3,-8)

foci: $(-2 + \sqrt{29}, -8)$ $(-2 - \sqrt{29}, -8)$

4. $\frac{(y-8)^2}{4} - \frac{(x-3)^2}{35} = 1$ U + D

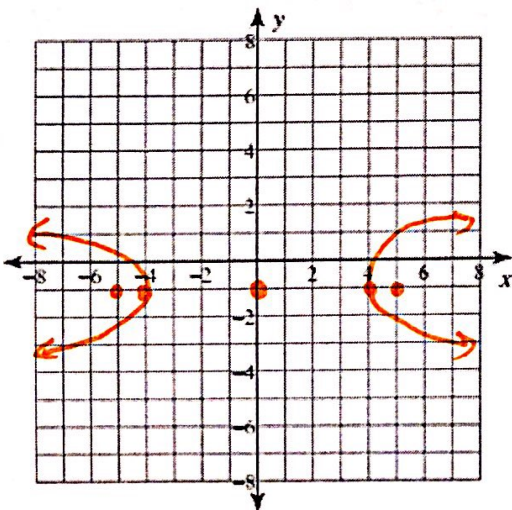
center: (3,8)

vertices: (3,10) (3,6)

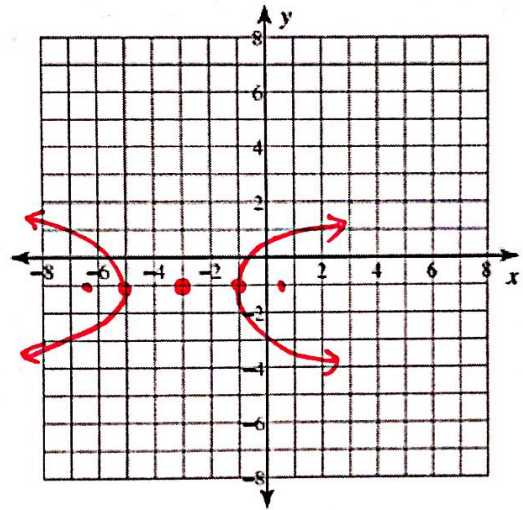
foci: $(3, 8 + \sqrt{39})$ $(3, 8 - \sqrt{39})$

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

5. $\frac{x^2}{16} - \frac{(y+1)^2}{9} = 1$



6. $\frac{(x+3)^2}{4} - \frac{(y+1)^2}{9} = 1$



Write the equation in standard form. Identify the center, vertices and foci.

7. $4x^2 + 72x - y^2 - 10y + 199 = 0$

$$4(x^2 + 18x + 81) - (y^2 + 10y + 25) = -199$$

+324
-25

$$4(x+9)^2 - (y+5)^2 = 100$$

$$\boxed{\frac{(x+9)^2}{25} - \frac{(y+5)^2}{100} = 1}$$

8. $x^2 - y^2 - 18x + 12y = 19$

$$(x^2 - 18x + 81) - (y^2 - 12y + 36) = 19$$

+81
-36

$$(x-9)^2 - (y-6)^2 = 64$$

$$\boxed{\frac{(x-9)^2}{64} - \frac{(y-6)^2}{64} = 1}$$