HW **Hyperbola (Part II)**

Write the equation of the hyperbola in standard form and then graph.

1. $-2x^2+5y^2+24x-20y-102=0$

$5(y^2-4y+4)-2(x^2-12x+36)=$ 102 20 −72

$5(y-2)^2-2(x-6)^2=50$

center: $(6,2)$ $\frac{(y-2)^2}{10}-\frac{(x-6)^2}{25}=1$

Equation:________________

$\sqrt{10}\approx 3.2$

$c=\sqrt{10+25}=\sqrt{35}$

Vertices: $(6, 2\pm\sqrt{10})$

Foci: $(6, 2\pm\sqrt{35})$

Asymptotes: $y-2=\frac{\sqrt{10}}{5}(x-6)$

2. $4x^2-25y^2+72x+50y+199=0$

$4(x^2+18x+81)-25(y^2-2y+1)=-199+724-25$

$4(x+9)^2-25(y-1)^2=500$

center: $(-9,1)$ $\frac{(x+9)^2}{125}-\frac{(y-1)^2}{20}=1$

Equation:________________

$\sqrt{125}=5\sqrt{5}$

≈ 11.2

$\sqrt{125+20}=\sqrt{145}$

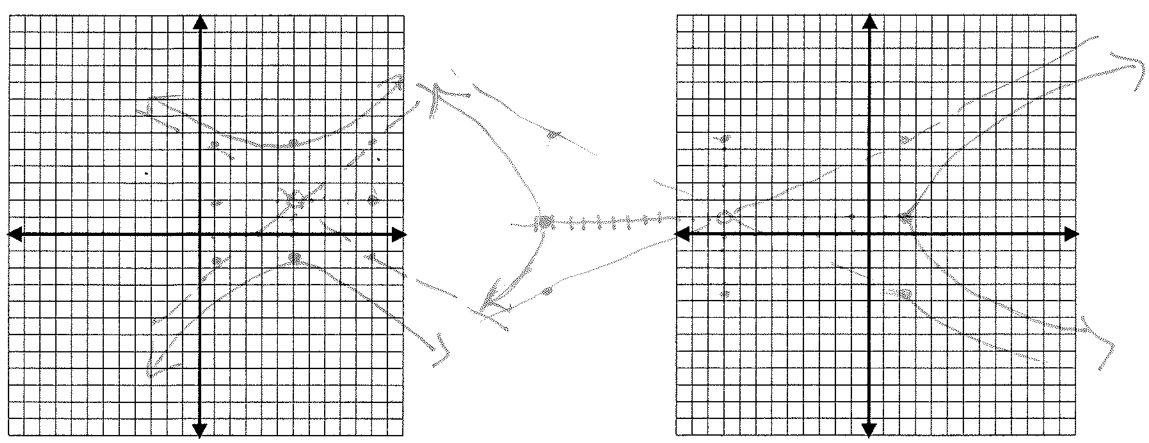
$\sqrt{20}\approx 4.5$

Vertices: $(-9\pm5\sqrt{5}, 1)$

Foci: $(-9\pm\sqrt{145}, 1)$

Asymptotes: $y-1=\frac{\pm2}{5}(y-1)$

$\frac{\sqrt{20}}{\sqrt{125}}=\frac{2\sqrt{5}}{5\sqrt{5}}$



Write the equation of the hyperbola described:

3. Foci (2, 0). (-2. 0)
   Vertices: (1, 0), (-1, 0)

$c=2$
$a=1$

$\frac{x^2}{1}-\frac{y^2}{3}=1$

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

$1+b^2=4$ $b^2=3$

4. Foci: (0. 5), (0, -5)
   Vertices: (0, 3), (0, -3)

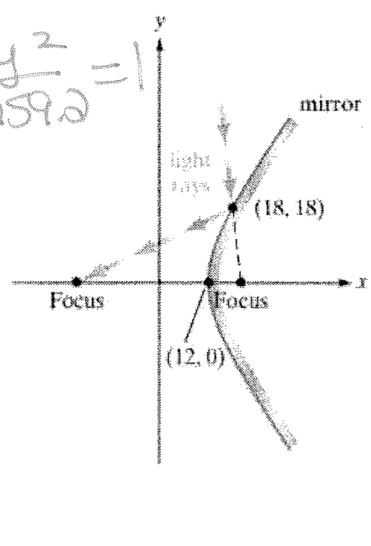
$\frac{y^2}{9}-\frac{x^2}{16}=1$

$9+b^2=25$

$b^2=16$

1. In the figure, a hyperbolic mirror is depicted. Write an equation that models the hyperbolic mirror's surface.

$\frac{x^2}{144}-\frac{y^2}{259.2}=1$



$a=12$

$\frac{x^2}{144}-\frac{y^2}{b^2}=1$

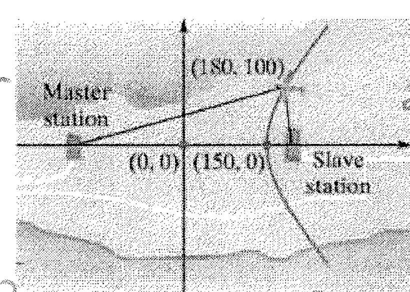
$\frac{18^2}{144}-\frac{18^2}{b^2}=1$

$\frac{18^2}{144}-1=\frac{18^2}{b^2}$

$1.25=\frac{18^2}{b^2}$

$b^2=18^2/1.25$

2. Write an equation that models the hyperbola depicted for an aircraft guided by a navigation system that employs hyperbolic tracking.



$\frac{x^2}{22500}-\frac{y^2}{22727.27}=1$

$\frac{(180)^2}{150^2}-\frac{(100)^2}{b^2}=1$

$\frac{180^2}{150^2}-1=\frac{(100)^2}{b^2}$

$100^2/.44=b^2$