Spiral Review:

1. What does SOH CAH TOA represent?

$\text{sine} = \frac{\text{opposite}}{\text{hyp}}$ $\text{cosine} = \frac{\text{adj.}}{\text{hyp}}$ $\text{tangent} = \frac{\text{opp}}{\text{adj}}$

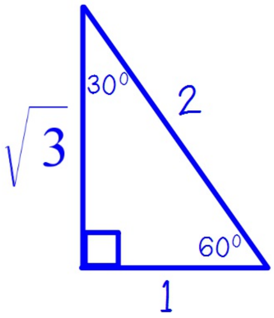
2. Use the triangle to the right.

a.) $\sin 30^0$ $\frac{1}{2}$

b.) $\cos 60^0$ $\frac{1}{2}$

c.) $\tan 30^0$ $\frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$

$\frac{\sqrt{3}}{3}$



p.656 9.3 Hyperbolas (Day 1)

$$\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$$

asymptote: $y = k \pm \frac{b}{a}(x-h)$
foci: $(h \pm c, k)$
vertices: $(h \pm a, k)$

$$\frac{(y-k)^2}{a^2} - \frac{(x-h)^2}{b^2} = 1$$

asymptote: $y = k \pm \frac{a}{b}(x-h)$
foci: $(h, k \pm c)$
vertices: $(h, k \pm a)$

$$* * \sqrt{c^2} = \sqrt{a^2+b^2} * *$$

$$c = \sqrt{a^2+b^2}$$

Students will be able to find the center, vertices, foci, asymptote, and sketch the hyperbola.

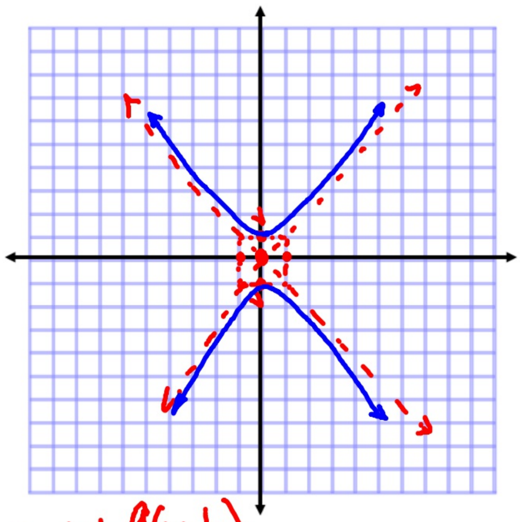
Example 1: Find the center, vertices, foci, asymptote and sketch the hyperbola.

a.) $y^2 - x^2 = 1$

$a = 1 \quad b = 1$

$c = \sqrt{1+1}$

$c = \sqrt{2}$



center: $(0,0)$

foci: $(h, k \pm c)$

$(0, 0 \pm \sqrt{2})$

Vertices: $(h, k \pm a)$

$(0, 0 \pm 1)$

$(0,1)\ (0,-1)$

asymptote: $y = k \pm \frac{a}{b}(x-h)$

$y = 0 \pm \frac{1}{1}(x-0)$

$y = \pm x$

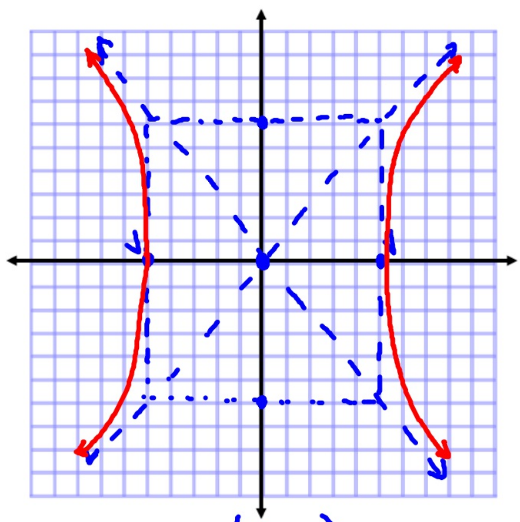
Students will be able to find the center, vertices, foci, asymptote, and sketch the hyperbola.

b.) $\frac{x^2}{25} - \frac{y^2}{36} = 1$

$a = 5 \quad b = 6$

$c = \sqrt{25+36}$

$c = \sqrt{61}$



center: $(0,0)$

foci: $(h \pm c, k)$

$(0 \pm \sqrt{61}, 0)$

Vertices: $(h \pm a, k)$

$(0 \pm 5, 0)$

$(-5,0)\ (5,0)$

asymptote: $y = k \pm \frac{b}{a}(x-h)$

$y = 0 \pm \frac{6}{5}(x-0)$

$y = \pm \frac{6}{5}x$

Students will be able to find the center, vertices, foci, asymptote, and sketch the hyperbola.

c.) $\frac{(x-2)^2}{4} - \frac{(y+5)^2}{25} = 1$

$a=2,\ b=5,\ c=\sqrt{4+25}$

$c=\sqrt{29}$

center: $(2,-5)$

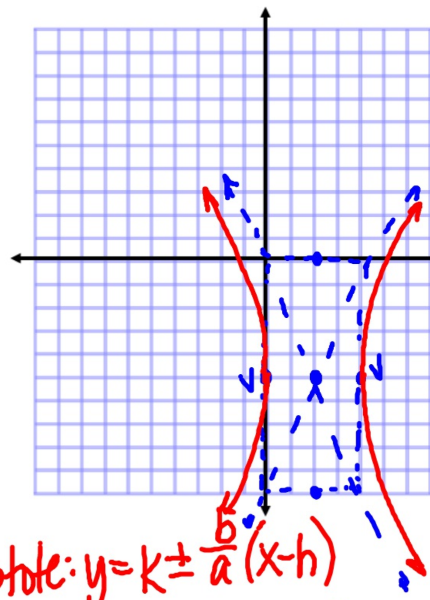
foci: $(h\pm c,k)$

$(2\pm\sqrt{29},-5)$

vertices: $(h\pm a,k)$

$(2\pm 2,-5)$

$(4,-5)$ $(0,-5)$



asymptote: $y=k\pm\frac{b}{a}(x-h)$

$y=-5\pm\frac{5}{2}(x-2)$

Students will be able to find the center, vertices, foci, asymptote, and sketch the hyperbola.

Example 2: Find the standard form of the equation of the hyperbola, center, vertices, foci, asymptote, and sketch.

a.) $\frac{25x^2}{100} - \frac{4y^2}{100} = \frac{100}{100}$

$\frac{x^2}{4} - \frac{y^2}{25} = 1$

$a=2,\ b=5,\ c=\sqrt{29}$

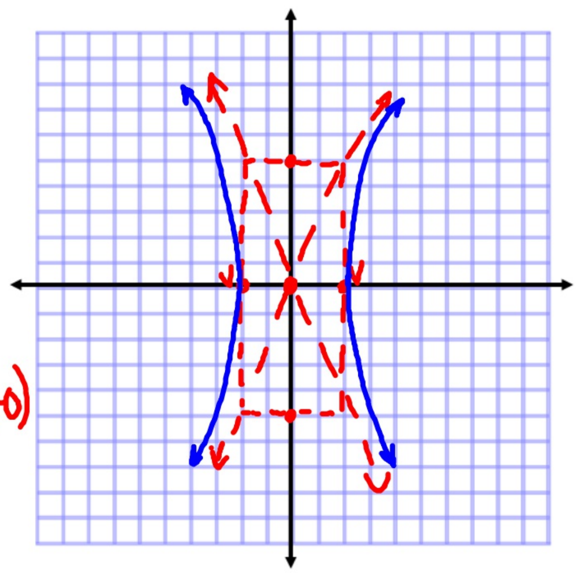
center: $(0,0)$

foci: $(\pm\sqrt{29},0)$

vertices: $(\pm 2,0)$

asym: $y=0\pm\frac{5}{2}(x-0)$

$y=\pm\frac{5}{2}x$



Students will be able to find the center, vertices, foci, asymptote, and sketch the hyperbola.

b.) $3y^2 - 5x^2 + 6y - 60x - 192 = 0$

$3y^2+6y \quad -5x^2-60x \quad =192$

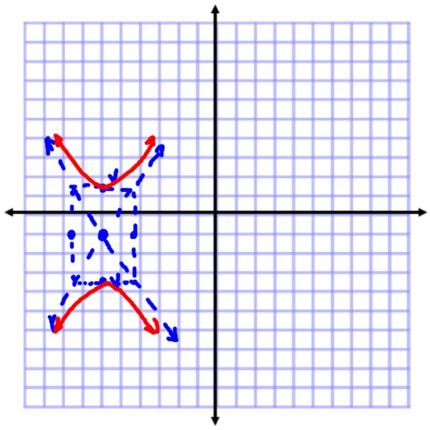
$3(y^2+2y+1)-5(x^2+12x+36)=192+3-180$

$\frac{3(y+1)^2}{15}-\frac{5(x+6)^2}{15}=\frac{15}{15}$

$\frac{(y+1)^2}{5}-\frac{(x+6)}{3}=1$

$a=\sqrt{5}$, $b=\sqrt{3}$, $c=\sqrt{5+3}$

$\approx 2.2 \quad \approx 1.7 \quad =2\sqrt{2}$



Center: $(-6,-1)$

foci: $(-6,-1\pm 2\sqrt{2})$

vertices: $(-6,-1\pm\sqrt{5})$

asymptote: $y=k\pm\frac{a}{b}(x-h)$

$y=-1\pm\frac{\sqrt{5}}{\sqrt{3}}(x+6)$

$y=-1\pm\frac{\sqrt{15}}{3}(x+6)$

Turn-in: p.665 (24, 36)

HW: p. 665 (7, 9, 21-27, 31-39 odds)