BE-Alg. 2 Tuesday 3-23-10

ACT Practice

① $-|x-3|-|2x-6|$, if $x=-2$

② $13\left(\dfrac{1}{\frac{1}{5}+\frac{2}{3}}\right)$

③ A rectangular lot that measures 150 ft. by 200 ft. is completely fenced. What is the approximate length, in feet, of the fence?

④ On 4 quizzes a student scored 65, 73, 81 and 82%. What must the Quiz 5 score be to have an average of 80%?

Ans ①
$-|(-2)-3|-|2(-2)-6|$
$-|-5|-|-4-6|$
$-(5)-(10)=\boxed{-15}$

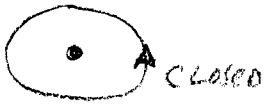
② $13\left(\dfrac{1}{\frac{3}{15}+\frac{10}{15}}\right)=13\left(\dfrac{1}{\frac{13}{15}}\right)=13\cdot\dfrac{15}{13}=\boxed{15}$

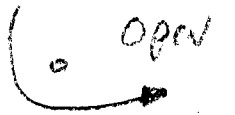
③ $200+200+150+150=\boxed{700\text{ ft}}$

④ $\overline{80}\Rightarrow$ 65, 73, 81, 82,
-15 -7 $+1$ $+2$ $\Rightarrow -19 \therefore 80+19=\boxed{99}$

Some "real world" places to find hyperbolas ⇒
- cooling towers
- Cassegrain telescopes (see blind spot link on bulletin board)

- Ripples from 2 rocks in a pond.
- rocket Nozzles.
- Sonic boom (where the sound waves strikes the earth)
- shape of a "open" orbit vs. closed (ellipse)

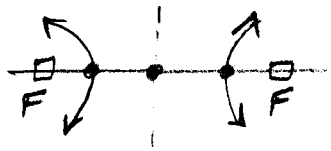




(swing by)

EX3 PG 443 Find the coordinates of the vertices and foci and the equations of the asymptotes for the hyperbola $\frac{x^2}{9} - \frac{y^2}{4} = 1$

$C(0,0)$ h, k — CENTER



LEFT-RIGHT Because "x" term is FIRST

$a^2 = 9$ $b^2 = 4$ $c^2 = a^2 + b^2$

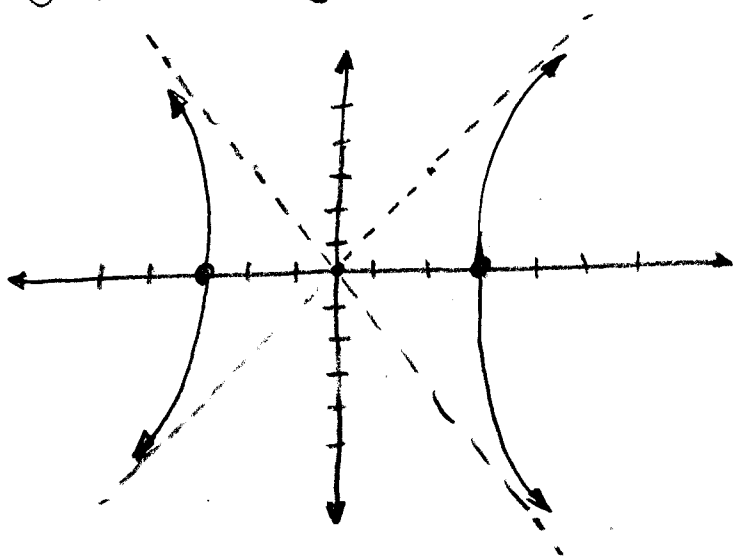
$a = 3$ $b = 2$ $c^2 = 9 + 4$ $c = \sqrt{13}$

$V(0 \pm 3, 0) =$ $(3,0), (-3,0)$ = Vertices

$F(0 \pm \sqrt{13}, 0) =$ $(\sqrt{13}, 0), (-\sqrt{13}, 0)$ = Foci

$(\approx 3.6, 0)$ $(\approx -3.6, 0)$ $y = \pm \frac{b}{a}$

Asymptotes $\Rightarrow (y - 0) = \pm \frac{2}{3}(x - 0)$ or $y = \pm \frac{2}{3}x$

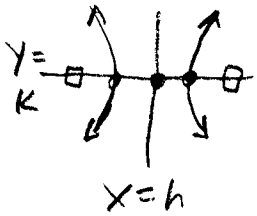


Ex 4 Pg. 444 $4x^2 - 9y^2 - 32x - 18y + 19 = 0$

$4x^2 - 32x \quad -9y^2 - 18y \quad = -19$

$4(x^2 - 8x + \boxed{4^2}) - 9(y^2 + 2y + \boxed{1^2}) = -19 + \boxed{64} - \boxed{9}$

$\frac{4(x-4)^2}{36} - \frac{9(y+1)^2}{36} = \frac{36}{36}$



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

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

$a^2 = 9 \quad \boxed{a = 3} \qquad b^2 = 4 \quad \boxed{b = 2} \qquad \boxed{c = \sqrt{13}}$

$\boxed{C(4, -1)}$

$V(4 \pm 3, -1)$

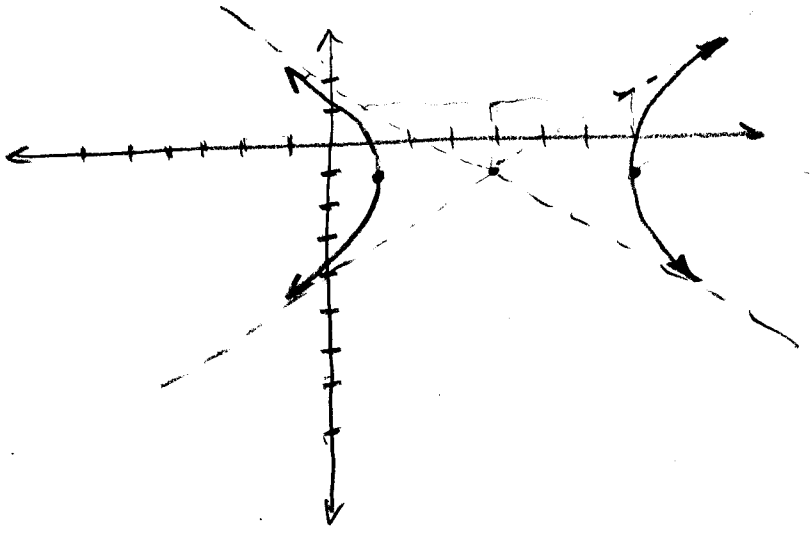
$\boxed{V(7, -1), (1, -1)}$

$F(4 \pm \sqrt{13}, -1)$

$\boxed{F(4+\sqrt{13}, -1), (4-\sqrt{13}, -1)}$

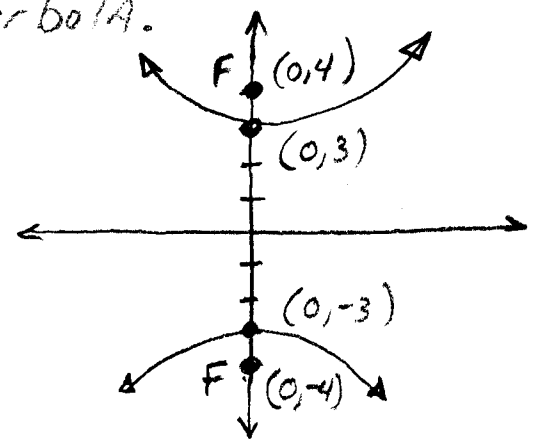
$\uparrow$ ~3.6 $\qquad$ $\uparrow$ ~3.6

Asymptotes: $\boxed{y+1 = \pm\frac{2}{3}(x-4)}$



Writing an equation given a graph of a hyperbola.

EX 1 Pg 442 Given:



Midpoint $\Rightarrow X = 0 = h$, $Y = 0 = K$ (Y First) $\Rightarrow \frac{Y^2}{a^2} - \frac{X^2}{b^2} = 1$

Vertex $\Rightarrow (0,3), (0,-3)$

$\Rightarrow (0,+a), (0,-a) \therefore a = 3$ $\quad a^2 = 9$

Foci $\Rightarrow (0,4), (0,-4)$

$\Rightarrow (0,+c), (0,-c) \therefore c = 4$ $\quad c^2 = 16$

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

$16 = 9 + b^2$

$7 = b^2$

$\therefore \boxed{\frac{y^2}{9} - \frac{x^2}{7} = 1}$

Homework: Pg. 445 # 4, 6, 7, 9.