BE-PRECALC | MONDAY 3-15-10

RECALL the 3 forms of a LINEAR EQUATION ⇒ WRITE THEIR formulas.

① Slope-Intercept form
② Standard form
③ Point-Slope form.

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④ PUT $2y = 6x + 4$ in all 3 forms

ANS

① $y = mx + b$

② $Ax + By = C$
$A > 0$, A, B, C = integers with no common factor > 1

③ $y - y_1 = m(x - x_1)$
(x_1, y_1) is known point.

④ $\frac{2y}{2} = \frac{6x}{2} + \frac{4}{2}$ ∴ $\boxed{y = 3x + 2}$ SI

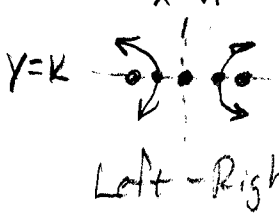
$6x - 2y = -4$ ∴ $\boxed{3x - y = -2}$ SF

PICK AN x, SAY $x = 1 \Rightarrow y = 5$ $(x, y) = (1, 5)$

∴ $\boxed{y - 5 = 3(x - 1)}$ PS

CK: $y = 3x - 3 + 5 \Rightarrow y = 3x + 2$ ✓

The standard form of the equations of a hyperbola:

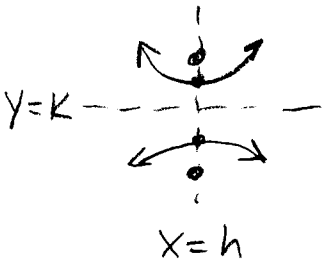


Left-Right

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

$C(h,k)$
$F(h \pm c, k)$
$V(h \pm a, k)$

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



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

$C(h,k)$
$F(h, k \pm c)$
$V(h, k \pm a)$

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

First term under $y \Rightarrow$ 

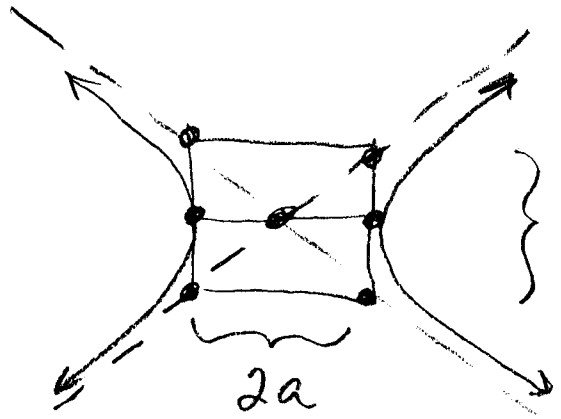
NOTE: Since a can equal b in a hyperbola (why can't it in an ellipse?) there is a special case where $a = b$ called an

Equilateral Hyperbola.

We'll cover this later.

Recall: the "ends" of each branch of the hyperbola are Asymptotic to lines. They approach but never touch these lines.

Ex



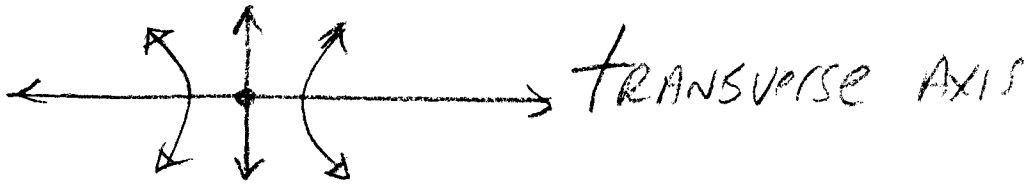
Rectangle Formed by a & b is useful for graphing.

$$y-k=\frac{-b}{a}(x-h)$$ EOL

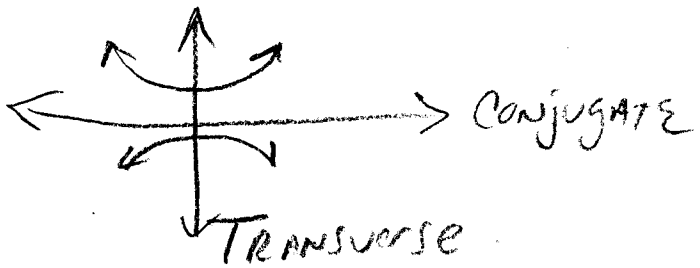
$$y-k=\frac{b}{a}(x-h)$$ EOL

POINT-SLOPE FORM

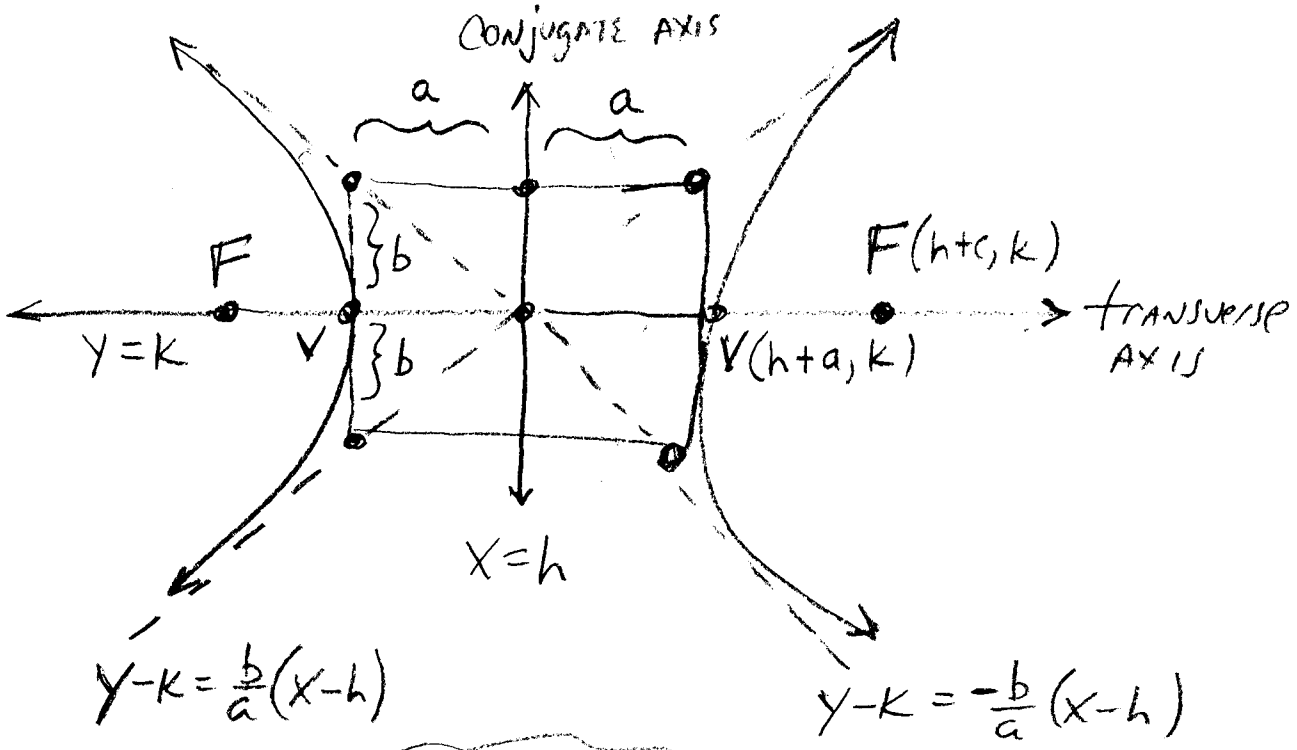
$$(y-y_1)=m(x-x_1)$$



CONJUGATE AXIS



Your work on the ellipse should help remembering the equation for hyperbolas and meaning and finding a, b, c. You need to learn some vocabulary terms & learn the EOL's for the asymptotes.



for up/down hyperbola $\frac{b}{a}$ becomes $\frac{a}{b}$

for up/down hyperbolas, change $-\frac{b}{a}$ to $-\frac{a}{b}$

Homework: Read ch 10-4 & learn the formulas & new vocabulary terms for hyperbolas.