yesterday's assignment:

11.4 #2, 5, 7, 9, 13, 15

21, 23, 35-41odd

Show work!

Label each part that you identify.

A rough sketch may be helpful for #35-41odd.

11.4 #21

21–28 Graphing Shifted Hyperbolas An equation of a hyperbola is given.

(a) Find the center, vertices, foci, and asymptotes of the hyperbola.

(b) Sketch a graph showing the hyperbola and its asymptotes.

21. $\dfrac{(x+1)^2}{9} - \dfrac{(y-3)^2}{16} = 1$

a^2 b^2

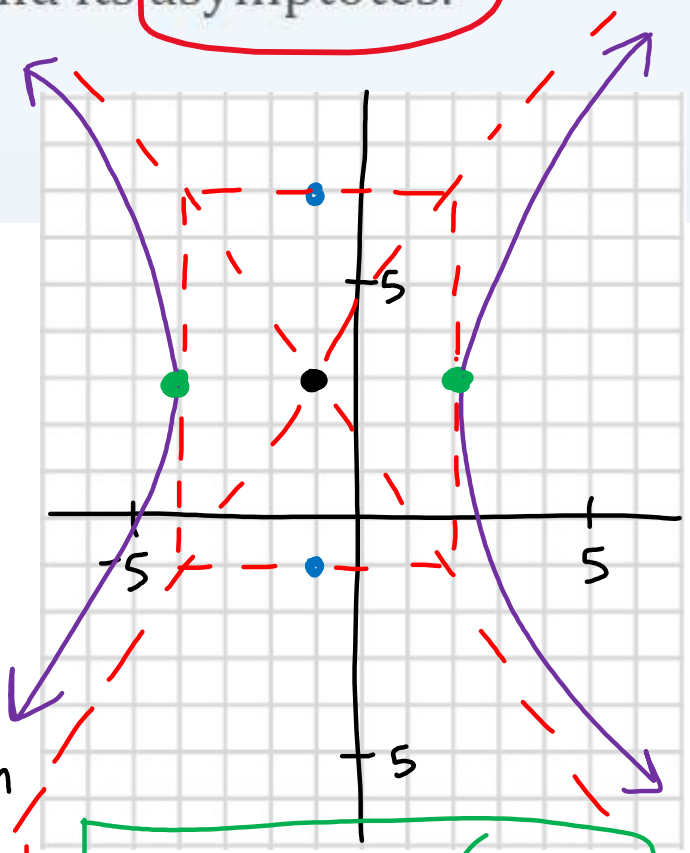
positive term

$a=3 \quad b=4$

Center $(-1, 3)$

$h \quad k$

use central box method to graph then identify points



ellipse: a^2 is the largest value

Vertices $(2,3)$ $(-4,3)$

identify using graph

OR → $(-1 \pm 3, 3)$

Foci and asymptotes on next 2 slides ↓

21–28 Graphing Shifted Hyperbolas An equation of a hyperbola is given.

11.4 #21 continued

(a) Find the center, vertices, foci, and asymptotes of the hyperbola.

(b) Sketch a graph showing the hyperbola and its asymptotes.

21. $\dfrac{(x+1)^2}{9} - \dfrac{(y-3)^2}{16} = 1$

and its asymptotes.

a^2 b^2

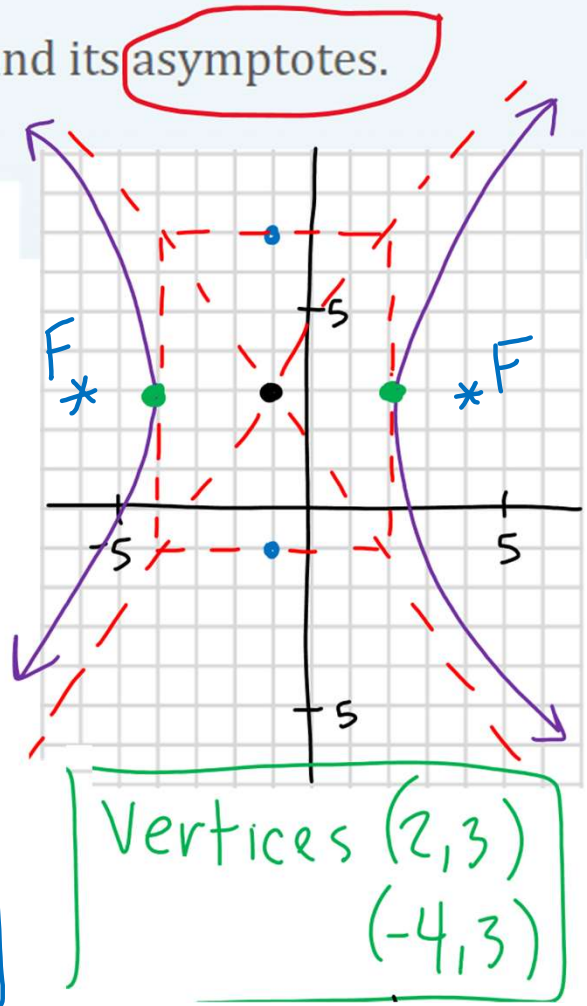
$a = 3$ $b = 4$

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

$c^2 = 9 + 16$

$c^2 = 25$

* $c = 5$



identify from graph

Foci (4,3) (-6,3)

or $(-1 \pm 5, 3)$

Vertices (2,3) (-4,3)

Asymptotes on next slide ↓

21–28 Graphing Shifted Hyperbolas An equation of a hyperbola is given.

11.4 #21 continued

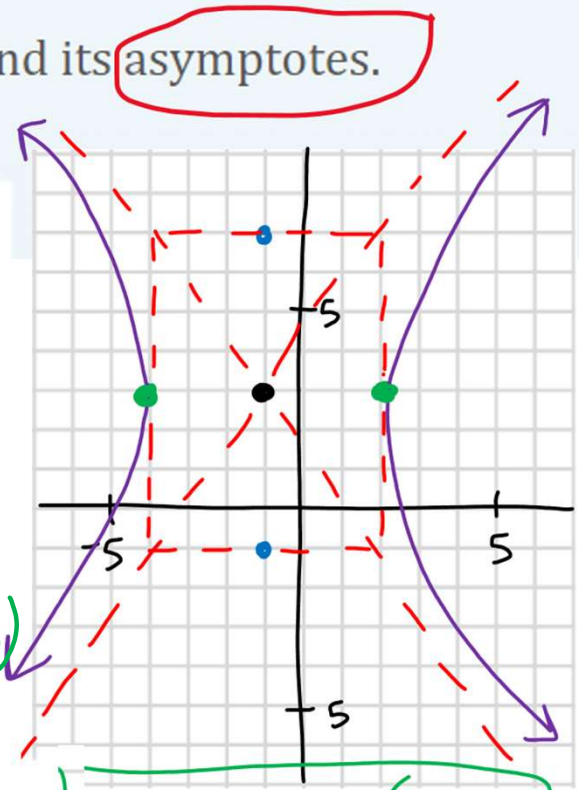
(a) Find the center, vertices, foci, and asymptotes of the hyperbola.

(b) Sketch a graph showing the hyperbola and its asymptotes.

21. $\dfrac{(x+1)^2}{9} - \dfrac{(y-3)^2}{16} = 1$

$a=3$ $b=4$

and its asymptotes.



Vertices $(2,3)$ $(-4,3)$

Asymptotes $y = \pm \frac{b}{a} x$

$y = \pm \frac{4}{3} x$

if centered at $(0,0)$

We have: $(y - \overset{k}{3}) = \pm \frac{4}{3}(x + \overset{h}{1})$

Center $(-1,3)$ h k

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

$y = \frac{4}{3}x + \frac{4}{3} - 3$ and $y = \frac{-4}{3}x - \frac{4}{3} - 3$

simplify using common denominator

21–28 Graphing Shifted Hyperbolas An equation of a hyperbola is given.

(a) Find the center, vertices, foci, and asymptotes of the hyperbola.

(b) Sketch a graph showing the hyperbola and its asymptotes.

21. $\dfrac{(x+1)^2}{9} - \dfrac{(y-3)^2}{16} = 1$

Be sure to plot all key points: vertices, foci, central box, and asymptotes.

11.4 #21

Answer

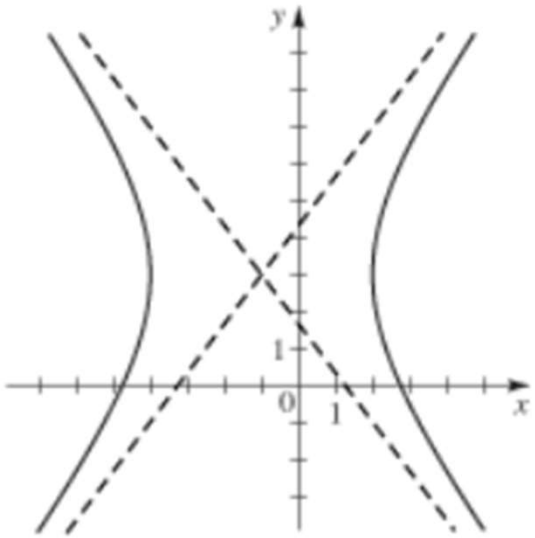
(a) $C(-1, 3)$

$V_1(-4, 3), V_2(2, 3)$

$F_1(-6, 3), F_2(4, 3)$

asymptotes $y = \dfrac{4}{3}x + \dfrac{13}{3}$ and $y = -\dfrac{4}{3}x + \dfrac{5}{3}$

(b)



15. $(y+5)^2 = -6x + 12$

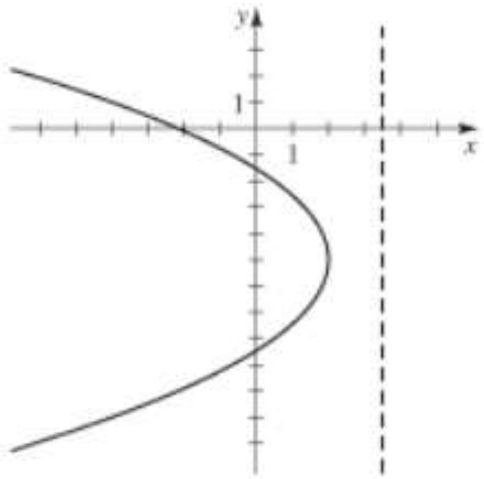
Answer

(a) $V\,(2, -5)$

$F\left(\frac{1}{2}, -5\right)$

directrix $x = \frac{7}{2}$

(b)



Be sure to plot all key points:

vertex, focus, focal diameter, and the directrix line.

Book graph is the basic idea…your graph should include more accurate values!