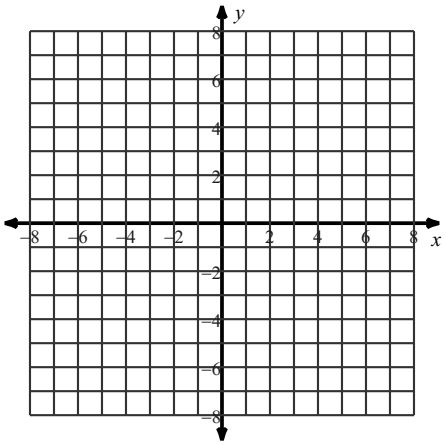
Algebra II Homework

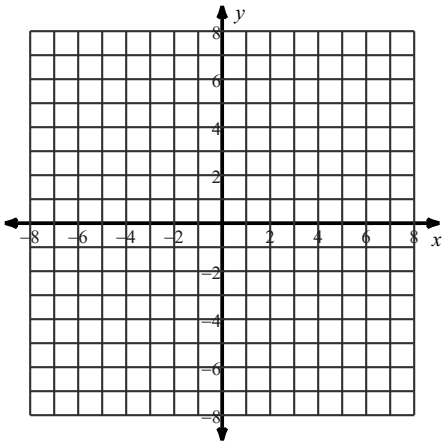
Graphing Hyperbolas Both General Form (GHBGF)

Identify the vertices, foci, and asymptotes of each. Then sketch the graph.

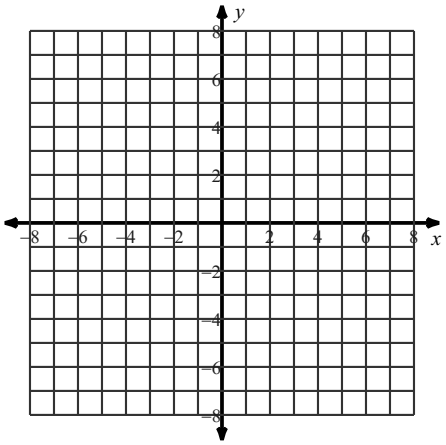
1) $-9x^2 + 4y^2 + 36x + 8y - 68 = 0$



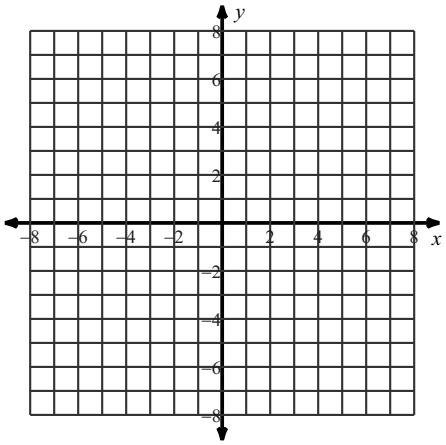
2) $x^2 - 4y^2 - 16 = 0$



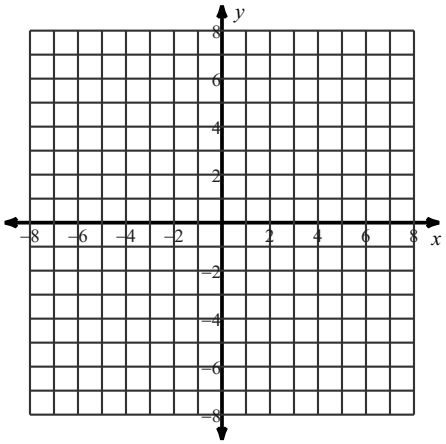
3) $-4x^2 + 25y^2 + 50y - 75 = 0$



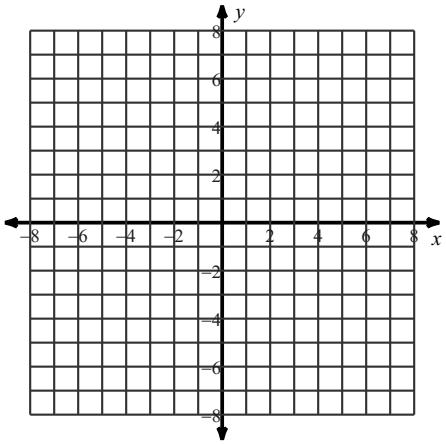
4) $x^2 - y^2 - 25 = 0$



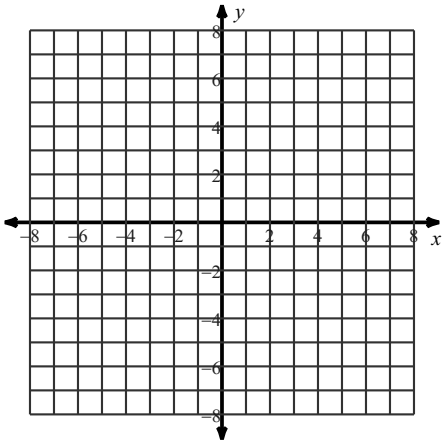
5) $-16x^2 + y^2 - 16 = 0$



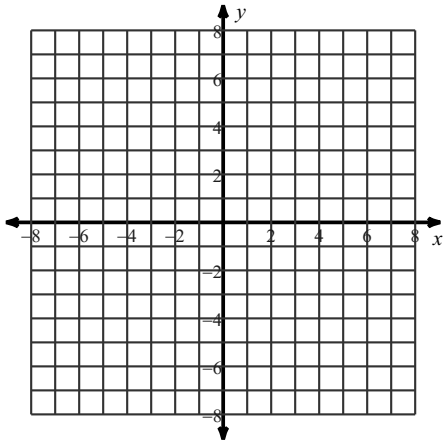
6) $-9x^2 + 25y^2 - 100y - 125 = 0$



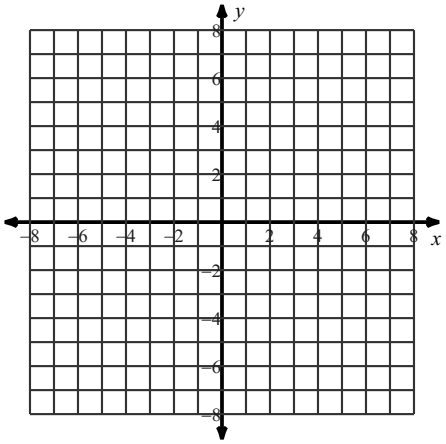
7) $-9x^2 + y^2 + 72x - 2y - 152 = 0$



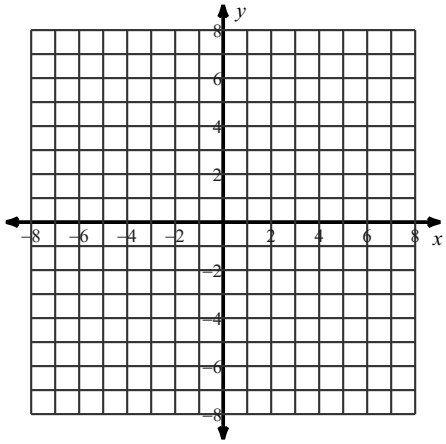
8) $-x^2 + y^2 - 4x - 4y - 1 = 0$



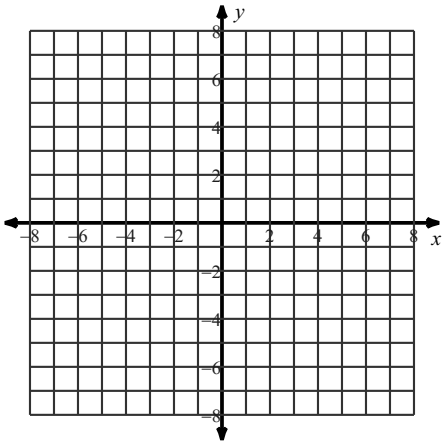
9) $-x^2 + y^2 - 2x - 8y + 14 = 0$



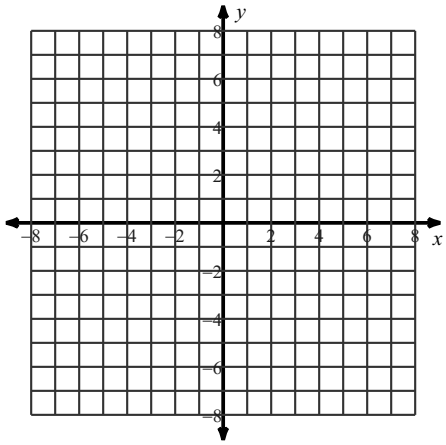
10) $-25x^2 + y^2 - 50x - 50 = 0$



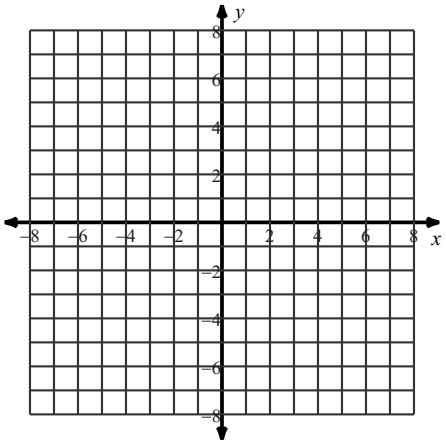
11) $-x^2 + 9y^2 - 2x - 18y - 1 = 0$



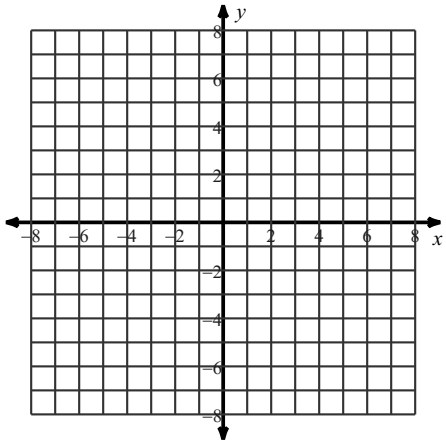
12) $x^2 - y^2 + 4y - 5 = 0$



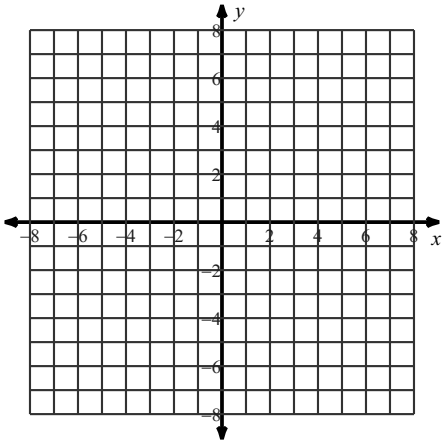
13) $x^2 - 16y^2 - 2x + 64y - 79 = 0$



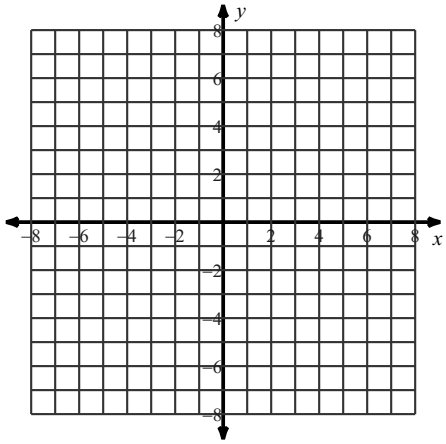
14) $-16x^2 + 25y^2 - 400 = 0$



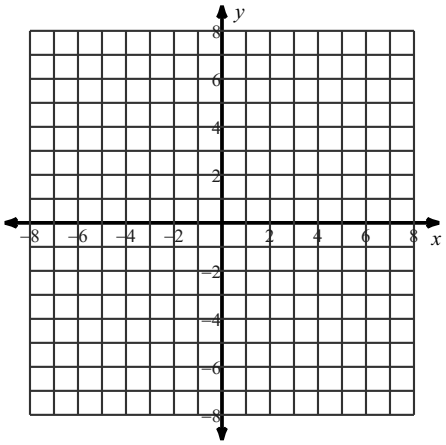
15) $-x^2 + 25y^2 - 100y + 75 = 0$



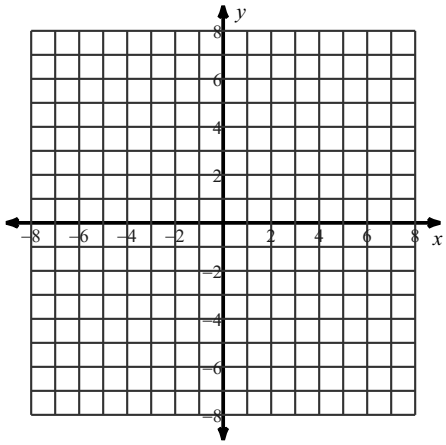
16) $-9x^2 + 25y^2 - 225 = 0$



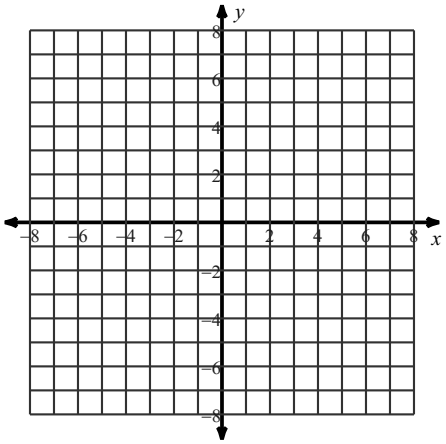
17) $4x^2 - 25y^2 + 100y - 200 = 0$



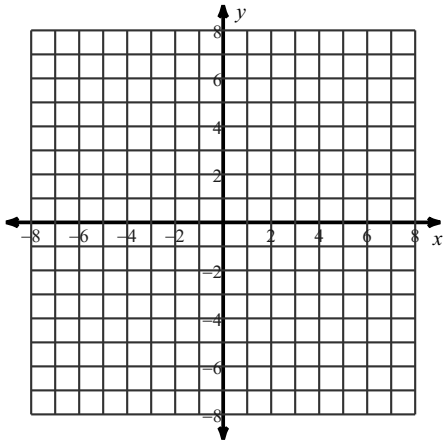
18) $-16x^2 + y^2 + 32x - 2y - 31 = 0$



19) $-16x^2 + y^2 + 96x - 2y - 159 = 0$

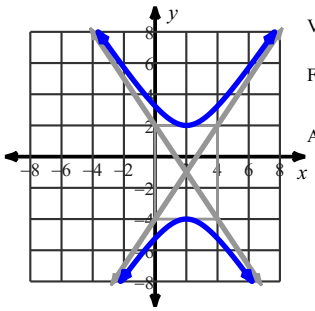


20) $-x^2 + y^2 - 2x - 17 = 0$



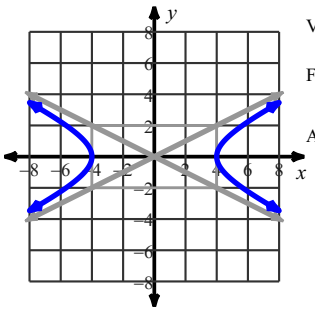
Answers to Graphing Hyperbolas Both General Form (GHBGF)

1)



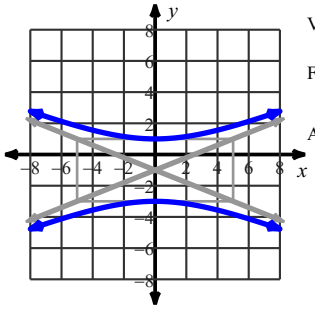
Vertices: $(2, 2)$ $(2, -4)$
Foci: $(2, -1 + \sqrt{13})$ $(2, -1 - \sqrt{13})$
Asym.: $y = \frac{3}{2}x - 4$ $y = -\frac{3}{2}x + 2$

2)



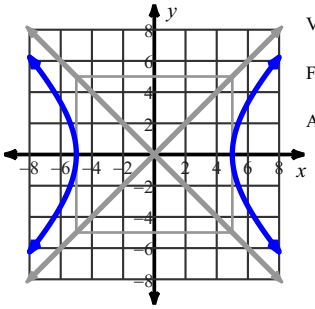
Vertices: $(4, 0)$ $(-4, 0)$
Foci: $(2\sqrt{5}, 0)$ $(-2\sqrt{5}, 0)$
Asym.: $y = \frac{1}{2}x$ $y = -\frac{1}{2}x$

3)



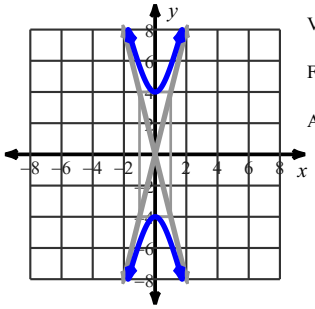
Vertices: $(0, 1)$ $(0, -3)$
Foci: $(0, -1 + \sqrt{29})$ $(0, -1 - \sqrt{29})$
Asym.: $y = \frac{2}{5}x - 1$ $y = -\frac{2}{5}x - 1$

4)



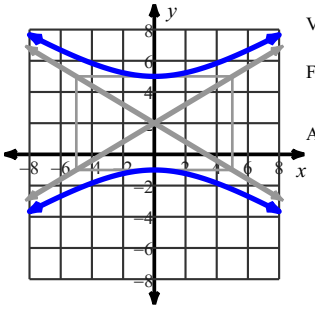
Vertices: $(5, 0)$ $(-5, 0)$
Foci: $(5\sqrt{2}, 0)$ $(-5\sqrt{2}, 0)$
Asym.: $y = x$ $y = -x$

5)



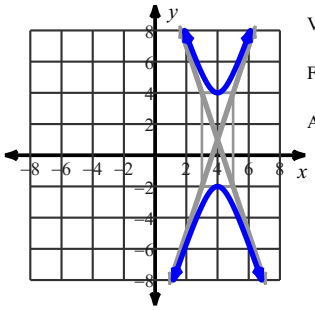
Vertices: $(0, 4)$ $(0, -4)$
Foci: $(0, \sqrt{17})$ $(0, -\sqrt{17})$
Asym.: $y = 4x$ $y = -4x$

6)



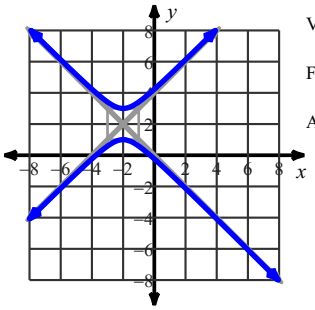
Vertices: $(0, 5)$ $(0, -1)$
Foci: $(0, 2 + \sqrt{34})$ $(0, 2 - \sqrt{34})$
Asym.: $y = \frac{3}{5}x + 2$ $y = -\frac{3}{5}x + 2$

7)



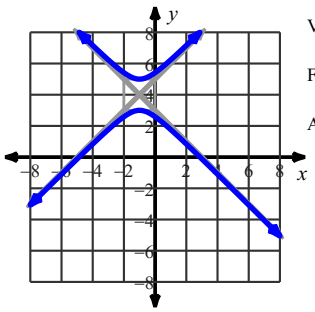
Vertices: $(4, 4)$ $(4, -2)$
Foci: $(4, 1 + \sqrt{10})$ $(4, 1 - \sqrt{10})$
Asym.: $y = 3x - 11$ $y = -3x + 13$

8)



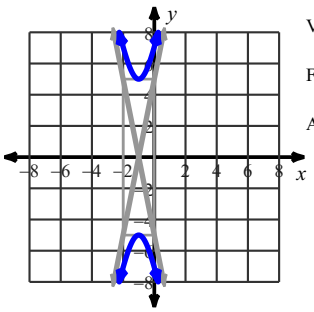
Vertices: $(-2, 3)$ $(-2, 1)$
Foci: $(-2, 2 + \sqrt{2})$ $(-2, 2 - \sqrt{2})$
Asym.: $y = x + 4$ $y = -x$

9)



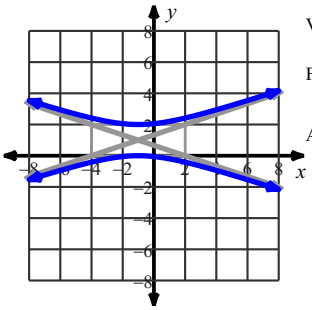
Vertices: $(-1, 5)$ $(-1, 3)$
Foci: $(-1, 4 + \sqrt{2})$ $(-1, 4 - \sqrt{2})$
Asym.: $y = x + 5$ $y = -x + 3$

10)



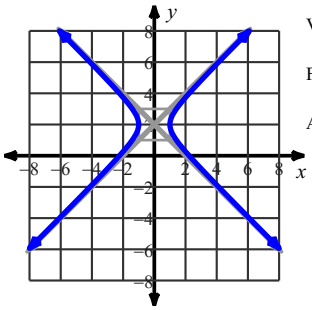
Vertices: $(-1, 5)$ $(-1, -5)$
Foci: $(-1, \sqrt{26})$ $(-1, -\sqrt{26})$
Asym.: $y = 5x + 5$ $y = -5x - 5$

11)



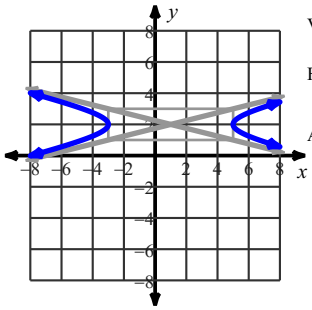
Vertices: $(-1, 2)$
$(-1, 0)$
Foci: $(-1, 1 + \sqrt{10})$
$(-1, 1 - \sqrt{10})$
Asym.: $y = \frac{1}{3}x + \frac{4}{3}$
$y = -\frac{1}{3}x + \frac{2}{3}$

12)



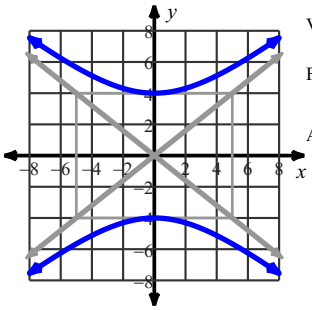
Vertices: $(1, 2)$
$(-1, 2)$
Foci: $(\sqrt{2}, 2)$
$(-\sqrt{2}, 2)$
Asym.: $y = x + 2$
$y = -x + 2$

13)



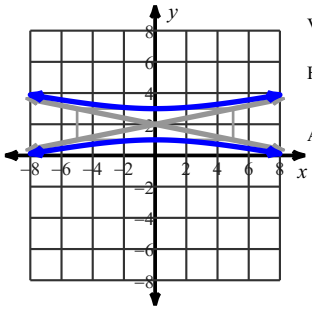
Vertices: $(5, 2)$
$(-3, 2)$
Foci: $(1 + \sqrt{17}, 2)$
$(1 - \sqrt{17}, 2)$
Asym.: $y = \frac{1}{4}x + \frac{7}{4}$
$y = -\frac{1}{4}x + \frac{9}{4}$

14)



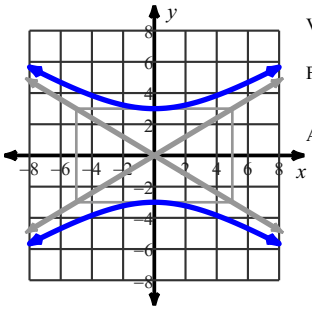
Vertices: $(0, 4)$
$(0, -4)$
Foci: $(0, \sqrt{41})$
$(0, -\sqrt{41})$
Asym.: $y = \frac{4}{5}x$
$y = -\frac{4}{5}x$

15)



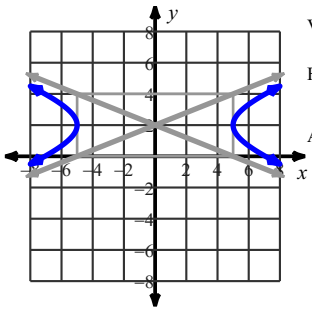
Vertices: $(0, 3)$
$(0, 1)$
Foci: $(0, 2 + \sqrt{26})$
$(0, 2 - \sqrt{26})$
Asym.: $y = \frac{1}{5}x + 2$
$y = -\frac{1}{5}x + 2$

16)



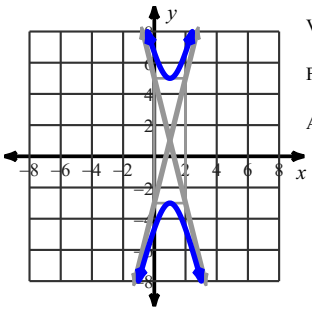
Vertices: $(0, 3)$
$(0, -3)$
Foci: $(0, \sqrt{34})$
$(0, -\sqrt{34})$
Asym.: $y = \frac{3}{5}x$
$y = -\frac{3}{5}x$

17)



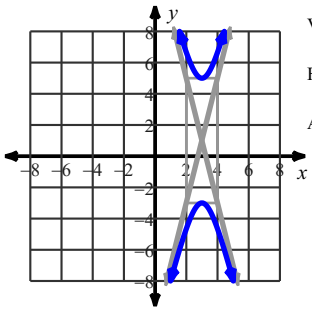
Vertices: $(5, 2)$
$(-5, 2)$
Foci: $(\sqrt{29}, 2)$
$(-\sqrt{29}, 2)$
Asym.: $y = \frac{2}{5}x + 2$
$y = -\frac{2}{5}x + 2$

18)



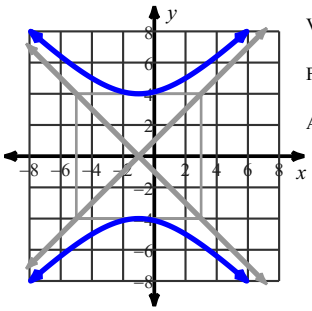
Vertices: $(1, 5)$
$(1, -3)$
Foci: $(1, 1 + \sqrt{17})$
$(1, 1 - \sqrt{17})$
Asym.: $y = 4x - 3$
$y = -4x + 5$

19)



Vertices: $(3, 5)$
$(3, -3)$
Foci: $(3, 1 + \sqrt{17})$
$(3, 1 - \sqrt{17})$
Asym.: $y = 4x - 11$
$y = -4x + 13$

20)



Vertices: $(-1, 4)$
$(-1, -4)$
Foci: $(-1, 4\sqrt{2})$
$(-1, -4\sqrt{2})$
Asym.: $y = x + 1$
$y = -x - 1$