

Practise, Apply, Solve 7.9U, page 615

- x-int.: ± 3
 - y-int.: ± 2
 - x-int.: $\pm\sqrt{18}$ or $\pm 3\sqrt{2}$
 - y-int.: $\pm\sqrt{12}$, $\pm 2\sqrt{3}$
 - x-int.: $\pm\sqrt{20}$ or $2\sqrt{5}$
 - x-int.: $\pm\sqrt{10}$
- $a = \sqrt{5}$, $b = \sqrt{20}$ or $2\sqrt{5}$, $c = 5$
 - $a = 6$, $b = 3$, $c = \sqrt{45}$ or $3\sqrt{5}$
 - $a = \sqrt{20}$ or $2\sqrt{5}$, $b = \sqrt{5}$, $c = 5$
 - $a = 2$, $b = 4$, $c = \sqrt{20}$ or $2\sqrt{5}$
 - $a = \sqrt{12}$ or $3\sqrt{2}$, $b = \sqrt{8}$ or $2\sqrt{2}$, $c = \sqrt{20}$ or $2\sqrt{5}$
 - $a = 12$, $b = 9$, $c = 15$
- asymptotes: $y = \frac{3}{2}x$, $y = -\frac{3}{2}x$; intercepts: $(2, 0)$, $(-2, 0)$; foci: $(-\sqrt{13}, 0)$, $(\sqrt{13}, 0)$
 - asymptotes: $y = \frac{4}{\sqrt{5}}x$, $y = -\frac{4}{\sqrt{5}}x$; intercepts: $(-\sqrt{5}, 0)$ and $(\sqrt{5}, 0)$; foci: $(\sqrt{21}, 0)$, $(-\sqrt{21}, 0)$
 - asymptotes: $y = \frac{9}{5}x$, $y = -\frac{9}{5}x$; intercepts: $(0, 9)$ and $(0, -9)$; foci: $(0, \sqrt{106})$, $(0, -\sqrt{106})$
 - asymptotes: $y = \frac{2\sqrt{2}}{5}x$, $y = -\frac{2\sqrt{2}}{5}x$; intercepts: $(0, 2\sqrt{2})$, $(0, -2\sqrt{2})$; foci: $(0, -\sqrt{33})$, $(0, \sqrt{33})$
 - asymptotes: $y = \frac{1}{\sqrt{2}}x$, $y = -\frac{1}{\sqrt{2}}x$; intercepts: $(0, 3)$, $(0, -3)$; foci: $(0, \sqrt{27})$, $(0, -\sqrt{27})$
 - asymptotes: $y = \frac{4}{3}x$ and $y = -\frac{4}{3}x$; intercepts: $(0, 4)$, $(0, -4)$; foci: $(0, 5)$, $(0, -5)$
- centre: $(0, 0)$, vertices: $(3, 0)$, $(-3, 0)$; asymptotes: $y = \frac{4}{3}x$, $y = -\frac{4}{3}x$
 - centre: $(0, 0)$, vertices: $(5, 0)$, $(-5, 0)$; asymptotes: $y = \frac{2}{5}x$, $y = -\frac{2}{5}x$
 - centre: $(0, 0)$, vertices: $(2, 0)$, $(-2, 0)$; $y = \sqrt{2}x$, $y = -\sqrt{2}x$
 - centre: $(0, 0)$, vertices: $(6, 0)$, $(-6, 0)$; asymptotes: $y = \frac{3}{2}x$, $y = -\frac{3}{2}x$
 - centre: $(2, 0)$, vertices: $(5, 0)$, $(-1, 0)$; asymptotes: $y = \frac{5}{3}(x - 2)$, $y = -\frac{5}{3}(x - 2)$
 - centre: $(-6, 1)$, vertices: $(-7, 1)$, $(-5, 1)$; asymptotes: $y = \frac{1}{2}x + 4$, $y = -\frac{1}{2}x + 4$
- $y = x$, $y = -x$
 - $y = 2x$, $y = -2x$
 - $y = \frac{5}{3}x$, $y = -\frac{5}{3}x$
 - $y = 2x$, $y = -2x$
- $(-7, 0)$ and $(7, 0)$
 - 14 units
 - $(-\sqrt{65}, 0)$ and $(\sqrt{65}, 0)$
 - $y = \frac{4}{7}x$ and $y = -\frac{4}{7}x$
- $\frac{x^2}{28} - \frac{y^2}{36} = -1$
 - $\frac{x^2}{27} - \frac{y^2}{9} = -1$
 - $\frac{x^2}{4} - \frac{y^2}{16} = -1$
 - $\frac{x^2}{9} - \frac{y^2}{16} = 1$
- asymptotes: $y = \frac{1}{3}x$, $y = -\frac{1}{3}x$; intercepts: $(3, 0)$, $(-3, 0)$
 - asymptotes: $y = \frac{1}{3}x$, $y = -\frac{1}{3}x$; intercepts: $(0, 1)$, $(0, -1)$

(c) asymptotes: $y = 3x$, $y = -3x$, intercepts: $(1, 0)$, $(-1, 0)$

(d) asymptotes: $y = 3x$, $y = -3x$, intercepts: $(0, 3)$, $(0, -3)$

The asymptotes of the first two graphs are the same but the graphs are oriented different ways. The asymptotes of the second two graphs are the same but the graphs are oriented different ways.

9. Asymptotes are $y = x$ and $y = -x$; conjugate and transverse axes are same length; $c = \sqrt{2}a$

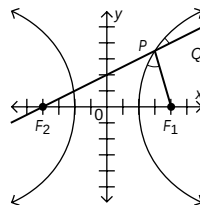
10. $\frac{x^2}{5} - \frac{y^2}{4} = -1$; asymptotes: $y = \frac{2}{\sqrt{5}}x$, $y = -\frac{2}{\sqrt{5}}x$; intercepts: $(0, 2)$, $(0, -2)$

11. centre $(2, -4)$, asymptotes: $y = x - 6$, $y = -x - 2$

12. (a) $\frac{(x+3)^2}{9} - \frac{(y-2)^2}{25} = 1$ (b) $\frac{(x-4)^2}{9} - \frac{(y+3)^2}{25} = 1$

(c) $\frac{(x-2)^2}{9} - \frac{y^2}{25} = 1$ (d) $\frac{(x+8)^2}{9} - \frac{(y+4)^2}{25} = 1$

13.



Answers will vary. According to this diagram: A ray originating at one focal point, F_1 , will reflect at P and follow to Q . An exterior of PQ will pass through F_2 .

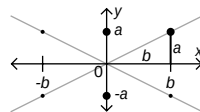
14. 10.16 m

15. $\frac{(x-1)^2}{9} - \frac{(y-6)^2}{16} = 1$

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

17. $\frac{x^2}{225} - \frac{y^2}{2275} = 1$

18.



From the diagram, the slope of the asymptotes is $\frac{a}{b}$ and $-\frac{a}{b}$. The equations of the asymptotes are: $y = \frac{a}{b}x$ and $y = -\frac{a}{b}x$.

19. The asymptotes are $y = \frac{5}{3}(x - 2)$ and $y = -\frac{5}{3}(x - 2)$. The asymptotes for a hyperbola are $y - k = \frac{b}{a}(x - h)$ and

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

20. foci: $(-4, 0)$, $(4, 0)$