

## Practise, Apply, Solve 7.10U, page 620

- (a) parabola, vertex  $(-1, 2)$       (b) hyperbola, centre  $(-1, 0)$   
 (c) ellipse, centre  $(3, 8)$       (d) ellipse, centre  $(0, -6)$   
 (e) parabola, vertex  $(-1, 1)$       (f) hyperbola, centre  $(2, -2)$

- (a) hyperbola      (b) ellipse      (c) parabola  
 (d) ellipse      (e) circle      (f) hyperbola  
 (g) ellipse      (h) parabola

- (a) hyperbola, centre  $(-4, 2)$ , foci on horizontal axis  
 (b) ellipse, centre  $(1, 0)$ , foci on vertical axis  
 (c) hyperbola, centre  $(-3, -4)$ , foci on horizontal axis

- (a) parabola

(b)  $(x - 1)^2 = \frac{1}{3}(y + 2)$

(c) vertex:  $(1, -2)$ , passing through  $(0, 1)$  and  $(2, 1)$

- (a) hyperbola

(b)  $\frac{(x - 2)^2}{\frac{1}{3}} - (y - 2)^2 = 1$

(c) centre  $(1, 2)$ , asymptotes:  $y = 3x - 1$ ,  $y = -3x + 5$ ,  $x$ -axis is the transverse axis

- (a) circle      (b)  $(x - 2)^2 + (y + 3)^2 = 1$

(c) centre  $(2, -3)$ , radius 1

- (a) ellipse,  $4x^2 + 9y^2 - 54y + 45 = 0$

(b) ellipse,  $x^2 + y^2 + 6x - 2y + 1 = 0$

(c) hyperbola,  $x^2 - 4y^2 + 8x + 24y - 4 = 0$

(d) parabola,  $x^2 - 4x + 6y + 10 = 0$

(e) hyperbola,  $5x^2 - 4y^2 - 10x - 16y - 31 = 0$

(f) parabola,  $y^2 + 6y - 2x + 11 = 0$

- (a)  $\frac{(x - 2)^2}{9} + \frac{(y + 3)^2}{4} = 1$ , ellipse, centre:  $(2, -3)$ , major axis (horizontal): 6, minor axis:

(b)  $\frac{(x - 3)^2}{9} + \frac{4\left(y + \frac{9}{2}\right)^2}{81} = 1$ ; hyperbola, centre:  $\left(3, \frac{9}{2}\right)$ , asymptotes:  $y = \frac{3}{2}x - 9$   
 $= -\frac{3}{2}x$ ,  $y$ -axis is transverse axis

- (c)  $\frac{(x - 3)^2}{3} - \frac{(y + 2)^2}{2} = 1$ , ellipse, centre:  $(3, -2)$ , major axis (horizontal):  $2\sqrt{3}$ , minor axis:  $2\sqrt{2}$

(d)  $\frac{-4\left(x - \frac{3}{2}\right)^2}{17} + \frac{2(y - 1)^2}{17} = 1$ ; hyperbola, centre:  $\left(\frac{3}{2}, 1\right)$ , asymptotes:  $y = -\sqrt{2}x + \frac{3\sqrt{2}}{2} + 1$  and  $\sqrt{2}x - \frac{3\sqrt{2}}{2} + 1$ ,  $y$ -axis is transverse axis

(e)  $(y - 4)^2 = 8(x + 2)$ ; parabola, opens to right, vertex  $(-2, 4)$ , passing through  $(0, 8)$  and  $(0, 0)$

- This equation appears to be of an ellipse since  $a$  and  $b$  do not equal 1. But,  $a = b$ ; so this equation is of a circle.

- (a)  $(2, 0)$

(b) foci:  $(2, 6)$ ,  $(2, -6)$ , vertices:  $(2, \sqrt{30})$ ,  $(2, -\sqrt{30})$

(c) transverse axis:  $2\sqrt{30}$ , conjugate axis:  $2\sqrt{6}$

(d)  $y = \pm\sqrt{5}(x - 2)$

11.  $y^2 - 4y + 12x - 44 = 0$

12.  $x^2 + y^2 - 4x - 6y - 12 = 0$

- (a) parabola, opens to right, vertex  $(4, -3)$ , passing through  $(5, -1)$  and  $(5, -5)$

(b) hyperbola, centre  $(2, 3)$ , asymptotes:  $y = \frac{3}{4}x + \frac{3}{2}$ ,  $y = -\frac{3}{4}x + \frac{9}{2}$ ,  $y$ -axis is transverse axis

(c) ellipse, centre:  $(1, 0)$ , major axis (vertical): 8, minor axis: 4

(d) parabola, opens up, vertex  $(2, 8)$ , passing through  $(0, 12)$  and  $(4, 12)$

(e) ellipse, centre:  $(-2, 2)$ , major axis (vertical): 10, minor axis: 4

14.  $2x^2 - y^2 - 16x + 2y + 31 = 0$

15.  $(x, y) \rightarrow (x + 3, y + 3)$

16.  $11x^2 - 25y^2 - 275 = 0$

17.  $x^2 + y^2 - 4x - 6y - 4 = 0$

- Answers may vary.

19.  $\frac{x^2}{4} - \frac{y^2}{7} = 1$

20. (a)  $16x^2 + 25y^2 - 32x - 384 = 0$

(b)  $7x^2 - 9y^2 + 14x - 56 = 0$

(c)  $9x^2 + 25y^2 + 36x - 150y + 36 = 0$

(d)  $11x^2 - 25y^2 + 22x + 200y - 664 = 0$