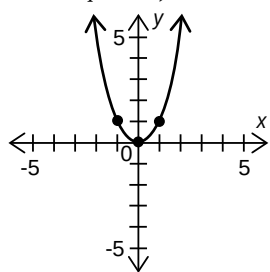
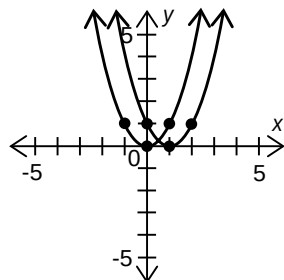


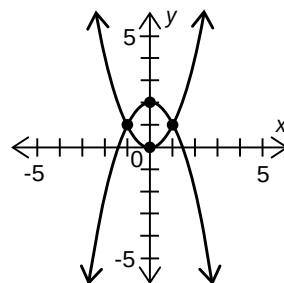
20. Infinite points of intersection: (both parabolas have the same equation)



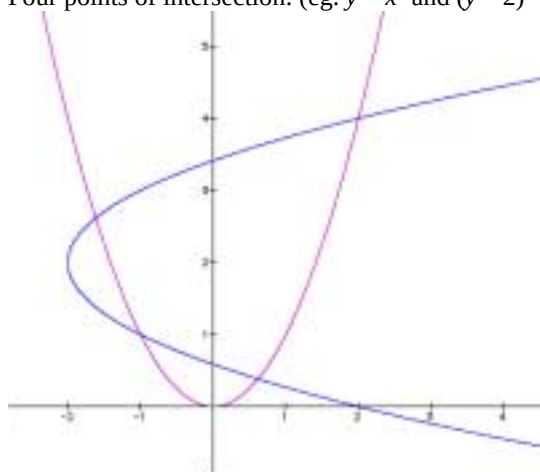
One point of intersection: (eg. $y = x^2$ and $y = (x - 1)^2$)



Two points of intersection: (eg. $y = x^2$ and $y = -x^2 + 2$)



Four points of intersection: (eg. $y = x^2$ and $(y - 2)^2 = (x + 2)$)



21. $y = x^2 - 5x - 4$ ①
 $y = -2x^2 + 3x - 1$ ②

Equate equations ① and ② and solve for x :

$$x^2 - 5x - 4 = -2x^2 + 3x - 1$$

$$3x^2 - 8x - 3 = 0$$

$$3x^2 - 9x + x - 3 = 0$$

$$3x(x - 3) + (x - 3) = 0$$

$$x = -\frac{1}{3}, x = 3$$

Now substitute into equation ① to solve for y :

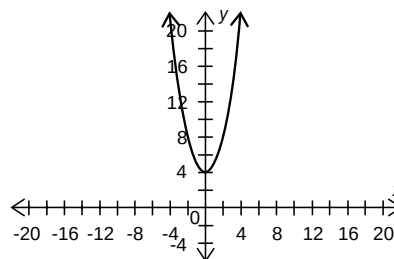
$$y = \left(-\frac{1}{3}\right)^2 + \frac{5}{3} - 4 = -\frac{20}{9}$$

$$y = (3)^2 - 5(3) - 4 = -10$$

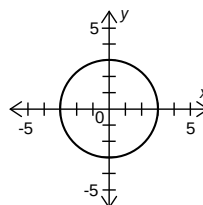
Thus the points of intersection are $\left(-\frac{1}{3}, -\frac{20}{9}\right)$ and $(3, -10)$.

Practice 7.8U, page 608

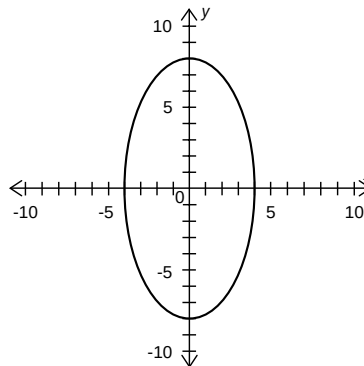
1. (a) i. parabola;
 ii. opens upward and is 4 units above the x -axis.
 iii.



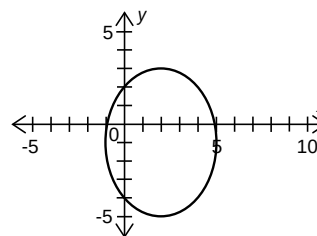
- (b) i. circle; ii. centred at origin with radius 3 units
 iii.



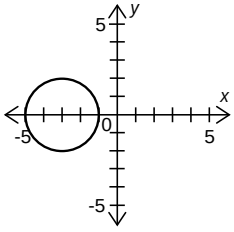
- (c) i. ellipse; ii. centred at origin, with major vertical axis of 16 units and minor axis of 8 units
 iii.



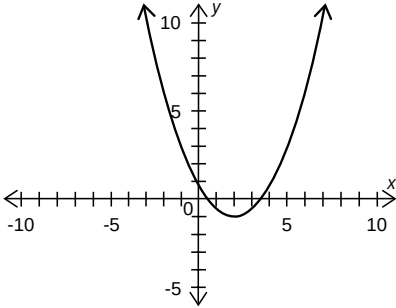
- (d) i. ellipse; ii. centred at $(2, -1)$ with major vertical axis of 8 units, and minor axis of 6 units
 iii.



- (e) i. circle; ii. centred at $(-3, 0)$ with radius 2 units
iii.

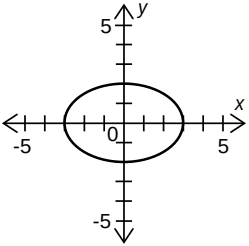


- (f) i. parabola; ii. opens upward with a vertex of $(2, -1)$
iii.



2. (a) $\frac{x^2}{9} + \frac{y^2}{4} = 1$

(b)



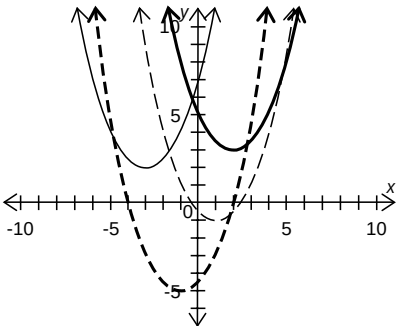
3. (a) i. $(x + 3)^2 = 2(y - 2)$

(b) i. $(x - 1)^2 = 2(y + 1)$

(c) i. $(x - 2)^2 = 2(y - 3)$

(d) i. $(x + 1)^2 = 2(y + 5)$

ii.



Practise, Apply, Solve 7.9U, page 615

1. (a) Let $y = 0$

$$4x^2 - 9(0)^2 = 36$$

$$4x^2 = 36$$

$$x^2 = 9$$

x -intercepts are ± 3 .

(b) Let $x = 0$

$$2(0)^2 - 3y^2 = -12$$

$$-3y^2 = -12$$

$$y^2 = 4$$

y -intercepts are ± 2 .

(c) Let $y = 0$

$$x^2 - (0)^2 = 18$$

$$x^2 = 18$$

x -intercepts are $\pm \sqrt{18}$ or $\pm 3\sqrt{2}$.

(d) Let $x = 0$

$$3y^2 - (0)^2 = 36$$

$$3y^2 = 36$$

$$y^2 = 12$$

y -intercepts are $\pm \sqrt{12}$ or $\pm 2\sqrt{3}$.

(e) Let $y = 0$

$$6x^2 - 10(0)^2 = 120$$

$$6x^2 = 120$$

$$x^2 = 20$$

x -intercepts are $\pm \sqrt{20}$ or $\pm 2\sqrt{5}$.

(f) Let $y = 0$

$$5x^2 - 10(0)^2 = 50$$

$$5x^2 = 50$$

$$x^2 = 10$$

x -intercepts are $\pm \sqrt{10}$.

2. (a) $\frac{x^2}{5} - \frac{y^2}{20} = 1$

$$a = \sqrt{5} \quad b = \sqrt{20}$$

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

$$c^2 = (\sqrt{5})^2 + (\sqrt{20})^2$$

$$c^2 = 5 + 20$$

$$c = 5$$

$$\therefore a = \sqrt{5} \quad b = \sqrt{20} \quad c = 5$$

(b) $\frac{x^2}{36} - \frac{y^2}{9} = 1$

$$a = 6 \quad b = 3$$

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

$$c^2 = 6^2 + 3^2$$

$$c^2 = 36 + 9$$

$$c^2 = 45$$

$$c = \sqrt{45}$$

$$\therefore a = 6 \quad b = 3 \quad c = \sqrt{45}$$

(c) $\frac{x^2}{5} - \frac{y^2}{20} = -1$

$$a = \sqrt{20} \quad b = \sqrt{5}$$

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

$$c^2 = 20 + 5$$

$$c^2 = 25$$

$$c = 5$$

$$\therefore a = \sqrt{20} \text{ or } 2\sqrt{5} \quad b = \sqrt{5} \quad c = 5$$