EXERCISE 2.7

Solve the following simultaneous equations.

Q. 1 $x + y = 5$

$x^2 - 2y - 14 = 0$

Solution:

$x + y = 5$ .... (i)

$x^2 - 2y - 14 = 0$ .... (ii)

From equation (i)

$x + y = 5$

$x = 5 - y$

Put it in equation (ii)

$(5 - y)^2 - 2y - 14 = 0$

$25 + y^2 - 10y - 2y - 14 = 0$

$y^2 - 12y + 11 = 0$

$y^2 - 11y - y + 11 = 0$

$y(y - 11) - 1(y - 11) = 0$

$(y - 11)(y - 1) = 0$

Either $y - 11 = 0$ or $y - 1 = 0$

$y = 11$ or $y = 1$

Putting the values of y in eq .....(i)

When $y = 11$	When $y = 1$
$x + y = 5$	$x + y = 5$
$x + 11 = 5$	$x + 1 = 5$
$x = 5 - 11$	$x = 5 - 1$
$x = -6$	$x = 4$

Solution Set is $\{(-6, 11), (4, 1)\}$

Q. 2 $3x - 2y = 1$

$x^2 + xy - y^2 = 1$

Solution:

$3x - 2y = 1$ .... (i)

$x^2 + xy - y^2 = 1$ ....(ii)

From equation (i)

$3x = 1 + 2y$

$x = \dfrac{1+2y}{3}$ ....(iii)

Put it in equation (ii)

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

$$\frac{1+4y^2+4y}{9} + \frac{y+2y^2}{3} - y^2 = 1$$

Multiplying by '9' on both sides we have

$$\frac{\not{9}(1+4y^2+4y)}{\not{9}} + \frac{{}^{3}\not{9}(y+2y^2)}{\not{3}} - 9(y^2) = 9\times 1$$

$1 + 4y^2 + 4y + 3y + 6y^2 - 9y^2 = 9$

$y^2 + 7y - 8 = 0$

$y^2 + 8y - y - 8 = 0$

$y(y + 8) - 1(y + 8) = 0$

$(y + 8)(y - 1) = 0$

Either

$y + 8 = 0$ or $y - 1 = 0$

$y = -8$ or $y = 1$

Putting these values in equation (iii)

when $y = -8$	when $y = 1$
$x = \dfrac{1+2y}{3}$	$x = \dfrac{1+2y}{3}$
$x = \dfrac{1+2(-8)}{3}$	$x = \dfrac{1+2(1)}{3}$
$x = \dfrac{1-16}{3}$	$x = \dfrac{1+2}{3}$
$x = \dfrac{-15}{3} = -5$	$x = \dfrac{3}{3} = 1$

Solution Set is $\{(-5,-8),(1,1)\}$

Q. 3 $x - y = 7$

$\dfrac{2}{x} - \dfrac{5}{y} = 2$

Solution:

$x - y = 7$ .... (i)

$\dfrac{2}{x} - \dfrac{5}{y} = 2$ .... (ii)

Multiplying equation (ii) by "xy" we have

$2y - 5x = 2xy$........ (iii)

From equation (i)

$x = 7 + y$

Put it in equation (iii)

$2y - 5(7 + y) = 2(7 + y)y$

$2y - 35 - 5y = 14y + 2y^2$

$\Rightarrow$ $2y^2 + 17y + 35 = 0$

$2y^2 + 10y + 7y + 35 = 0$

$2y(y + 5) + 7(y + 5) = 0$

$(y + 5)(2y + 7) = 0$

Either

$y + 5 = 0$ or $2y + 7 = 0$

$y = -5$ or $y = \dfrac{-7}{2}$

Now putting these values of y in equation (i)

When $y = -5$

$x = 7 + y$

$x = 7 + (-5)$

$x = 7 - 5$

$x = 2$

When $y = \frac{-7}{2}$

$x = 7 + y$

$x = 7 + \left(\frac{-7}{2}\right)$

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

$x = \frac{14-7}{2}$

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

$$Solution\ Set\ is\ \left\{(2,-5),\left(\frac{7}{2},\frac{-7}{2}\right)\right\}$$

Q. 4 $x + y = a - b$

$\frac{a}{x} - \frac{b}{y} = 2$

Solution:

$x + y = a - b$ ....(i)

$\frac{a}{x} - \frac{b}{y} = 2 \Rightarrow \frac{ay - bx}{xy} = 2$

$ay - bx = 2xy$ ....(ii)

From equation (i)

$x = a - b - y$ ....(iii)

Put it in equation (ii)

$ay - bx = 2xy$

$ay - b(a - b - y) = 2(a - b - y)y$

$ay - ba + b^2 + by = 2ay - 2by - 2y^2$

$2y^2 - 2ay + ay + 2by + by + b^2 - ab = 0$

$2y^2 - ay + 3by + b^2 - ab = 0$

$2y^2 - y(a - 3b) + (b^2 - ab) = 0$

By using quadratic formula

$a = 2, \quad b = -(a - 3b), \ c = (b^2 - ab)$

$$y = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$y = \frac{-[-(a-3b)] \pm \sqrt{[-(a-3b)]^2 - 4(2)(b^2 - ab)}}{2(2)}$$

$$y = \frac{(a-3b) \pm \sqrt{a^2 + 9b^2 - 6ab - 8b^2 + 8ab}}{4}$$

$$y = \frac{(a-3b) \pm \sqrt{a^2 + b^2 + 2ab}}{4}$$

$$y = \frac{(a-3b) \pm \sqrt{(a+b)^2}}{4}$$

$$y = \frac{(a-3b) \pm (a+b)}{4}$$

$y = \frac{\cancel{a} - 3b - \cancel{a} - b}{4}$ or $y = \frac{a - 3b + a + b}{4}$

$y = \frac{-4b}{4}$ or $y = \frac{2a - 2b}{4}$

$y = \frac{2(a-b)}{4}$

$y = -b$ or $y = \frac{a-b}{2}$

Putting these values of y in equation (iii)

when $y = -b$

$x = a - b - y$

$x = a - b - (-b)$

$x = a - \cancel{b} + \cancel{b}$

$x = a$

when $y = \frac{a-b}{2}$

$x = a - b - y$

$x = a - b - \frac{a-b}{2}$

$x = \frac{2a - 2b - a + b}{2}$

$x = \frac{a-b}{2}$

$$Solution\ Set\ is\ \left\{(a,-b),\left(\frac{a-b}{2},\frac{a-b}{2}\right)\right\}$$

Q. 5 $x^2 + (y-1)^2 = 10$
$x^2 + y^2 + 4x = 1$

Solution:

$x^2 + (y-1)^2 = 10$ ……….. (i)

$x^2 + y^2 + 4x = 1$ …………(ii)

Subtracting equation (ii) from (i)

$$\cancel{x^2} + \cancel{y^2} + 1 - 2y = 10$$
$$\pm \cancel{x^2} \pm \cancel{y^2} \quad \pm 4x = \pm 1$$

$$-4x - 2y + 1 = 9$$
$$-4x - 2y = 9 - 1$$
$$-4x - 2y = 8$$
$$-2(2x + y) = 8$$
$$\Rightarrow \quad 2x + y = \frac{8}{-2}$$
$$2x + y = -4$$
$$y = -4 - 2x \quad \text{……….(iii)}$$

Put in equation (ii)

$$x^2 + (-4 - 2x)^2 + 4x = 1$$
$$x^2 + [-(4 + 2x)]^2 + 4x = 1$$
$$x^2 + [16 + 4x^2 + 16x] + 4x = 1$$
$$5x^2 + 20x + 16 - 1 = 0$$
$$5x^2 + 20x + 15 = 0$$
$$5(x^2 + 4x + 3) = 0$$
$$\Rightarrow \quad x^2 + 4x + 3 = 0 \qquad (\because 5 \neq 0)$$
$$x^2 + 3x + x + 3 = 0$$
$$x(x + 3) + 1(x + 3) = 0$$
$$(x + 3)(x + 1) = 0$$

Either $x + 3 = 0$ or $x + 1 = 0$

$x = -3$ or $x = -1$

Putting these values of x in equation (iii)

when $x = -3$	when $x = -1$
$y = -4 - 2x$	$y = -4 - 2x$
$y = -4 - 2(-3)$	$y = -4 - 2(-1)$
$y = -4 + 6$	$y = -4 + 2$
$y = 2$	$y = -2$

So, the solution Set is $\{(-3, 2), (-1, -2)\}$

Q.6 $(x+1)^2 + (y+1)^2 = 5$, $(x+2)^2 + y^2 = 5$

Solution: $(x+1)^2 + (y+1)^2 = 5$ ………(i)

$(x+2)^2 + y^2 = 5$ ……………(ii)

From equation (i)

$$x^2 + 1 + 2x + y^2 + 1 + 2y = 5$$
$$x^2 + y^2 + 2x + 2y + 2 = 5$$
$$x^2 + y^2 + 2x + 2y = 3 \quad \text{……….. (iii)}$$

From equation (ii)

$$(x+2)^2 + y^2 = 5$$
$$x^2 + 4 + 4x + y^2 = 5$$
$$x^2 + y^2 + 4x = 5 - 4$$
$$x^2 + y^2 + 4x = 1 \quad \text{…………….. (iv)}$$

Subtracting equation (iv) from (iii)

$$\cancel{x^2} + \cancel{y^2} + 2x + 2y = 3$$
$$\pm \cancel{x^2} \pm \cancel{y^2} \pm 4x \quad = \pm 1$$

$$-2x + 2y = 2$$
$$-2(x - y) = 2$$
$$x - y = \frac{2}{-2}$$
$$x - y = -1$$
$$x = y - 1 \quad \text{………………..(v)}$$

Put it in equation (iv)

$$(y-1)^2 + y^2 + 4(y-1) = 1$$
$$y^2 + 1 - 2y + y^2 + 4y - 4 = 1$$
$$2y^2 + 2y - 4 + \cancel{1} - \cancel{1} = 0$$
$$2y^2 + 2y - 4 = 0$$
$$2(y^2 + y - 2) = 0$$
$$\Rightarrow \quad y^2 + y - 2 = 0 \qquad (\because 2 \neq 0)$$
$$y^2 + y - 2 = 0$$
$$y^2 + 2y - y - 2 = 0$$
$$y(y + 2) - 1(y + 2) = 0$$
$$(y + 2)(y - 1) = 0$$

Either $y + 2 = 0$ or $y - 1 = 0$

$y = -2$ $\quad$ $y = 1$

Putting these values of y in equation (v)

when $y = -2$	when $y = 1$
$x = y - 1$	$x = y - 1$
$x = -2 - 1$	$x = 1 - 1$
$x = -3$	$x = 0$

So, the solution Set is $\{(-3, -2), (0, 1)\}$

Q. 7 $\quad x^2 + 2y^2 = 22$

$5x^2 + y^2 = 29$

Solution:

$x^2 + 2y^2 = 22$ .... (i)

$5x^2 + y^2 = 29$ .... (ii)

Multiplying equation (ii) by "2" we have

$10x^2 + 2y^2 = 58$ .... (iii)

Subtracting equation (i) from (iii)

$10x^2 + \cancel{2y^2} = 58$

$\pm x^2 \pm \cancel{2y^2} = \pm 22$

$9x^2 = 36$

$x^2 = \frac{36}{9}$

$x^2 = 4$

Taking square root, we have

$\sqrt{x^2} = \sqrt{4}$

$x = \pm 2$

$\Rightarrow x = -2$ or $x = 2$

Now putting these values of x in equation (i)

When $x = -2$	When $x = 2$
$x^2 + 2y^2 = 22$	$x^2 + 2y^2 = 22$
$(-2)^2 + 2y^2 = 22$	$(2)^2 + 2y^2 = 22$
$4 + 2y^2 = 22$	$4 + 2y^2 = 22$
$2y^2 = 22 - 4$	$2y^2 = 22 - 4$
$2y^2 = 18$	$2y^2 = 18$
$y^2 = \frac{18}{2}$	$y^2 = \frac{18}{2}$
$y^2 = 9$	$y^2 = 9$
$\Rightarrow y = \pm 3$	$\Rightarrow y = \pm 3$

So, the solution set is $\{(\pm 2, \pm 3)\}$

Q.8 $\quad 4x^2 - 5y^2 = 6$

$3x^2 + y^2 = 14$

Solution:

$4x^2 - 5y^2 = 6$ .... (i)

$3x^2 + y^2 = 14$ .... (ii)

Multiplying equation (ii) by 5 and add in equation (i)

$4x^2 - \cancel{5y^2} = 6$

$15x^2 + \cancel{5y^2} = 70$

$19x^2 = 76$

$x = \frac{76}{19}$

$x^2 = 4$

$\Rightarrow \quad x = \pm 2$

Either $x = 2$ or $x = -2$

Putting these values of x in equation (ii)

When x = 2,	When x = −2
$3(2)^2 + y^2 = 14$	$3(-2)^2 + y^2 = 14$
$3(4) + y^2 = 14$	$3(4) + y^2 = 14$
$12 + y^2 = 14$	$12 + y^2 = 14$
$y^2 = 14 - 12$	$y^2 = 14 - 12$
$y^2 = 2$	$y^2 = 2$
$y = \pm\sqrt{2}$	$y = \pm\sqrt{2}$

So the solution set is $\{(\pm 2, \pm\sqrt{2})\}$

Q. 9 $\quad 7x^2 - 3y^2 = 4$

$2x^2 + 5y^2 = 7$

Solution:

$7x^2 - 3y^2 = 4$ ———— (i)

$2x^2 + 5y^2 = 7$ ———— (ii)

Multiply equation (i) by 5 and equation (ii) by 3 and add them

$35x^2 - \cancel{15y^2} = 20$

$6x^2 + \cancel{15y^2} = 21$

$41x^2 = 41$

$x^2 = \frac{41}{41}$

$x^2 = 1$

$x = \pm\sqrt{1}$

$x = \pm 1$

Either $x = 1$ or $x = -1$

Putting these values of x in equation (i)

When x = 1

$7(1)^2-3y^2=4$

$7-3y^2=4$

$-3y^2=4-7$

$-3y^2=-3$

$y^2=\frac{-3}{-3}$

$y^2=1$

$y=\pm\sqrt{1}$

$y=\pm 1$

When x = −1

$7(-1)^2-3y^2=4$

$7(1)-3y^2=4$

$7-3y^2=4$

$-3y^2=4-7$

$-3y^2=-3$

$y^2=\frac{-3}{-3}$

$y^2=1$

$y=\pm 1$

So the solution set is $\{(\pm 1, \pm 1)\}$

Q. 10 $\mathbf{x^2+2y^2=3}$

$\mathbf{x^2+4xy-5y^2=0}$

Solution:

$x^2+2y^2=3$ ———— (i)

$x^2+4xy-5y^2=0$ ———— (ii)

Factorizing equation (ii) we get

$x^2+4xy-5y^2=0$

$x^2+5xy-xy-5y^2=0$

$x(x+5y)-y(x+5y)=0$

$(x+5y)(x-y)=0$

Either $x+5y=0$ or $x-y=0$

$x=-5y$ —— (iii) $x=y$ —— (iv)

Putting these values of x in equation (i)

When x = −5y

$(-5y)^2+2y^2=3$

$25y^2+2y^2=3$

$27y^2=3$

$y^2=\frac{3}{27}$

$y^2=\frac{1}{9}$

$y=\pm\sqrt{\frac{1}{9}}$

$y=\pm\frac{1}{3}$

$\boxed{y=\frac{1}{3} \text{ or } y=\frac{-1}{3}}$

When x = y

$y^2+2(y^2)=3$

$3y^2=3$

$y^2=\frac{3}{3}$

$y^2=1$

$y=\pm\sqrt{1}$

$\boxed{y=-1, \text{ or } y=1}$

Putting the value of $y=\pm\frac{1}{3}$ in equation (iii)

When $y=\frac{1}{3}$

$x=-5y$

$x=-5\left(\frac{1}{3}\right)$

$x=\frac{-5}{3}$

When $y=\frac{-1}{3}$

$x=-5y$

$x=-5\left(\frac{-1}{3}\right)$

$x=\frac{5}{3}$

Now putting the values of y=± 1in equation (iv)

$x=y$

When y = 1 then x = 1

When y = −1 then x = −1

Solution Set is $\left\{(-1,-1),(1,1),\left(\frac{5}{3},\frac{-1}{3}\right),\left(\frac{-5}{3},\frac{1}{3}\right)\right\}$

Q. 11 $\mathbf{3x^2-y^2=26}$

$\mathbf{3x^2-5xy-12y^2=0}$

Solution:

$3x^2-y^2=26$ ———— (i)

$3x^2-5xy-12y^2=0$ ———— (ii)

Factorizing equation (ii)

$3x^2-5xy-12y^2=0$

$3x^2-9xy+4xy-12y^2=0$

$3x(x-3y)+4y(x-3y)=0$

$(x-3y)(3x+4y)=0$

Either

$x-3y=0$ or $3x+4y=0$

$x=3y$ ——— (iii) $3x=(-4y)$

$x=\frac{-4y}{3}$ ...(iv)

From equation (iii) putting the value of x in equation (i)

$3(3y)^2-y^2=26$

$3(9y)^2-y^2=26$

$27y^2-y^2=26$

$26y^2=26$

$y^2=1$

$y=\pm 1$

$y=1$ *or* $y=-1$

Putting these value of y in equation (iii)

When y = 1

$x = 3y$

$x = 3(1)$

$x = 3$

$(x, y) = (3,1)$

When y = −1

$x = 3y$

$x = 3(-1)$

$x = -3$

$(x, y) = (-3,-1)$

From equation (iv) putting the values of x in equation (i)

$$3\left(\frac{-4y}{3}\right)^2 - y^2 = 26$$

$$3\times\frac{16y^2}{9} - y^2 = 26$$

$$\frac{48y^2 - 9y^2}{9} = 26$$

$$39y^2 = 26\times 9$$

$$y^2 = \frac{234}{39}$$

$$y^2 = 6$$

$$\Rightarrow \quad y = \pm\sqrt{6}$$

$$y = \sqrt{6} \quad or \quad y = -\sqrt{6}$$

Putting these values of y in equation (iv)

When y = $\sqrt{6}$

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

$$x = \frac{-4\sqrt{6}}{3}$$

$$(x, y) = \left(\frac{-4\sqrt{6}}{3}, \sqrt{6}\right)$$

When y = $-\sqrt{6}$

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

$$x = \frac{-4(-\sqrt{6})}{3}$$

$$x = \frac{4\sqrt{6}}{3}$$

$$(x, y) = \left(\frac{4\sqrt{6}}{3}, -\sqrt{6}\right)$$

So, the Solution set is

$$\left\{(3,1), (-3,-1), \left(\frac{-4\sqrt{6}}{3}, \sqrt{6}\right), \left(\frac{4\sqrt{6}}{3}, -\sqrt{6}\right)\right\}$$

Q. 12 $\quad \mathbf{x^2 + xy = 5}$ ———— **(i)**

$\mathbf{y^2 + xy = 3}$ ———— **(ii)**

Multiply equation (i) by 3 and equation (ii) by 5 and subtract them

$$3x^2 + 3xy = 15$$

$$\pm 5xy \pm 5y^2 = -15$$

$$3x^2 - 2xy - 5y^2 = 0$$

$$3x^2 - 5xy + 3xy - 5y^2 = 0$$

$$x(3x - 5y) + y(3x - 5y) = 0$$

Either $\quad (3x - 5y)(x + y) = 0$

3x−5y=0 or x + y = 0

3x=5y or $\boxed{x = -y}$ …(iv)

$\boxed{x = \frac{5y}{3}}$ ———(iii)

From equation (iv) put y = −x in equation (i)

$$(-y)^2 + (-y)y = 5$$

$$y^2 - y^2 = 5$$

$$0 \neq 5$$

Impossible

Now from equation (iii) put $x = \frac{5y}{3}$ in equation (i)

$$\left(\frac{5y}{3}\right)^2 + \frac{5y}{3}\times y = 5$$

$$\frac{25y^2}{9} + \frac{5y^2}{3} = 5$$

Multiply by 9

$$9\times\frac{25y^2}{9} + 9\times\frac{5y^2}{3} = 9\times 5$$

$$25y^2 + 15y^2 = 45$$

$$40y^2 = 45$$

$$y^2 = \frac{45}{40}$$

$$y^2 = \frac{9}{8}$$

$$y = \pm\sqrt{\frac{9}{8}}$$

$$= \pm\sqrt{\frac{3^2}{4\times 2}}$$

$$y = \pm\frac{3}{2\sqrt{2}}$$

$$y = \frac{3}{2\sqrt{2}} \quad or \quad y = \frac{-3}{2\sqrt{2}}$$

Now putting the value of y in equation (iii)

When $y = \frac{3}{2\sqrt{2}}$

Then $x = \frac{5}{\cancel{3}}\times\frac{\cancel{3}}{2\sqrt{2}}$

$$x = \frac{5}{2\sqrt{2}}$$

$$\left(\frac{5}{2\sqrt{2}}, \frac{3}{2\sqrt{2}}\right)$$

When $y = \frac{-3}{2\sqrt{2}}$

Then $x = \frac{5}{\cancel{3}}\times\left(\frac{-\cancel{3}}{2\sqrt{2}}\right)$

$$x = \frac{-5}{2\sqrt{2}}$$

$$\left(\frac{-5}{2\sqrt{2}}, \frac{-3}{2\sqrt{2}}\right)$$

Solution set is $\left\{\left(\frac{5}{2\sqrt{2}}, \frac{3}{2\sqrt{2}}\right), \left(\frac{-5}{2\sqrt{2}}, \frac{-3}{2\sqrt{2}}\right)\right\}$

Q. 13 $\mathbf{x^2 - 2xy = 7}$

$\mathbf{xy + 3y^2 = 2}$

Solution:

$$x^2 - 2xy = 7 \text{ ——— (i)}$$

$$xy + 3y^2 = 2 \text{ ——— (ii)}$$

Multiplying equation (i) by 2 and equation (ii) by 7 and subtracting them, we get

$$2x^2 - 4xy = \cancel{14}$$

$$\pm 7xy \pm 21y^2 = \cancel{14}$$

$$2x^2 - 11xy - 21y^2 = 0$$

$$2x^2 - 14xy + 3xy - 21y^2 = 0$$

$$2x(x - 7y) + 3y(x - 7y) = 0$$

$$(x - 7y)(2x + 3y) = 0$$

Either $x - 7y = 0$ or $2x + 3y = 0$

$x = 7y$ ——— (iii) or $2x = -3y$

or $x = \frac{-3}{2}y$ ——— (iv)

From equation (iii) Put $x = 7y$ in equation (i)

$$(7y)^2 - 2(7y)y = 7$$

$$49y^2 - 14y^2 = 7$$

$$35y^2 = 7$$

$$y^2 = \frac{7}{35}$$

$$y^2 = \frac{1}{5}$$

$$y = \pm\frac{1}{\sqrt{5}}$$

Either $y = \frac{1}{\sqrt{5}}$ or $y = \frac{-1}{\sqrt{5}}$

Putting these values of y in equation (iii)

When $y = \frac{1}{\sqrt{5}}$

$x = 7y$

Then $x = 7\left(\frac{1}{\sqrt{5}}\right)$

$$x = \frac{7}{\sqrt{5}}$$

$$(x, y) = \left(\frac{7}{\sqrt{5}}, \frac{1}{\sqrt{5}}\right)$$

When $y = \frac{-1}{\sqrt{5}}$

$x = 7y$

Then $x = 7\left(\frac{-1}{\sqrt{5}}\right)$

$$x = \frac{-7}{\sqrt{5}}$$

$$(x, y) = \left(\frac{-7}{\sqrt{5}}, \frac{-1}{\sqrt{5}}\right)$$

From equation (iv) putting the value of x in equation (i)

$$\left(\frac{-3}{2}y\right)^2 - 2\left(\frac{-3}{2}y\right)y = 7$$

$$\frac{9}{4}y^2 + 3y^2 = 7$$

$$9y^2 + 12y^2 = 28$$

$$21y^2 = 28$$

$$y^2 = \frac{28}{21}$$

$$y^2 = \frac{4}{3}$$

$$\sqrt{y^2} = \pm\sqrt{\frac{4}{3}}$$

$$y = \pm\frac{2}{\sqrt{3}}$$

Either $y = \frac{2}{\sqrt{3}}$ or $y = \frac{-2}{\sqrt{3}}$

Putting these values of y in equation (iv)

When $y = \frac{2}{\sqrt{3}}$

Then $x = \frac{-3}{2}\left(\frac{2}{\sqrt{3}}\right)$

$x = -\sqrt{3}$

$(x, y) = \left(-\sqrt{3}, \frac{2}{\sqrt{3}}\right)$

When $y = \frac{-2}{\sqrt{3}}$

Then $x = -\frac{3}{2}\left(\frac{-2}{\sqrt{3}}\right)$

$x = \sqrt{3}$

$(x, y) = \left(\sqrt{3}, \frac{-2}{\sqrt{3}}\right)$

So, the Solution set is

$$\left\{\left(\frac{7}{\sqrt{5}}, \frac{1}{\sqrt{5}}\right), \left(\frac{-7}{\sqrt{5}}, \frac{-1}{\sqrt{5}}\right), \left(-\sqrt{3}, \frac{2}{\sqrt{3}}\right), \left(\sqrt{3}, \frac{-2}{\sqrt{3}}\right)\right\}$$