

Exercise 2.7

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Solve the following simultaneous equations.

1. $x + y = 5$; $x^2 - 2y - 14 = 0$

$$x + y = 5 \text{ ----- (i)}$$

$$x^2 - 2y - 14 = 0 \text{ ----- (ii)}$$

From equation (i) we have:

$$y = 5 - x \text{ ----- (iii)}$$

Putting in equation (ii)

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

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

$$x^2 - 10 + 2x - 14 = 0$$

$$x^2 + 2x - 24 = 0$$

$$x^2 + 6x - 4x - 24 = 0$$

$$x(x + 6) - 4(x + 6) = 0$$

$$(x + 6)(x - 4) = 0$$

$$x + 6 = 0$$

;

$$x - 4 = 0$$

$$x = -6$$

;

$$x = 4$$

Putting the values of x in equation (iii)

$$y = 5 - x$$

;

$$y = 5 - x$$

$$y = 5 - (-6)$$

;

$$y = 5 - (4)$$

$$y = 5 + 6$$

;

$$y = 5 - 4$$

$$y = 11$$

;

$$y = 1$$

So,

$$S.S = \{(-6, 11), (4, 1)\}$$

2. $3x - 2y = 1$; $x^2 + xy - y^2 = 1$

$$3x - 2y = 1 \text{ ----- (i)}$$

$$x^2 + xy - y^2 = 1 \text{ ----- (ii)}$$

From equation (i) we have:

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

$$y = \frac{1-3x}{-2}$$

$$y = \frac{3x-1}{2} \text{ ----- (iii)}$$

Putting in equation (ii)

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

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

$$x^2 + \frac{3x^2-x}{2} - \frac{9x^2-6x+1}{4} = 1$$

$$\frac{4x^2+2(3x^2-x)-(9x^2-6x+1)}{4} = 1$$

$$\frac{4x^2+6x^2-2x-9x^2+6x-1}{4} = 1$$

$$\frac{x^2+4x-1}{4} = 1$$

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

$$x^2 + 4x - 1 - 4 = 0$$

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

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

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

$$x(x + 5) - 1(x + 5) = 0$$

$$(x + 5)(x - 1) = 0$$

$$x + 5 = 0 ;$$

$$x = -5 ;$$

$$x - 1 = 0$$

$$x = 1$$

Putting the values of x in equation (iii)

$$y = \frac{3x-1}{2} ;$$

$$y = \frac{3(-5)-1}{2} ;$$

$$y = \frac{-16}{2} ;$$

$$y = -8 ;$$

$$y = \frac{3x-1}{2}$$

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

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

$$y = 1$$

So,

$$S.S = \{(-5, -8), (1, 1)\}$$

$$3. \quad x - y = 7 ; \quad \frac{2}{x} - \frac{5}{y} = 2$$

$$x - y = 7 \text{ ----- (i)}$$

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

$$\frac{2y-5x}{xy} = 2$$

$$2y - 5x = 2xy$$

$$2y - 5x - 2xy = 0 \text{ ----- (ii)}$$

From equation (i) we have:

$$x - y = 7$$

$$-y = 7 - x$$

$$y = x - 7 \text{ ----- (iii)}$$

Putting in equation (ii)

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

$$2(x - 7) - 5x - 2x(x - 7) = 0$$

$$2x - 14 - 5x - 2x^2 + 14x = 0$$

$$-2x^2 + 11x - 14 = 0$$

$$2x^2 - 11x + 14 = 0$$

$$2x^2 - 7x - 4x + 14 = 0$$

$$x(2x - 7) - 2(2x - 7) = 0$$

$$(2x - 7)(x - 2) = 0$$

$$2x - 7 = 0 \quad ; \quad x - 2 = 0$$

$$2x = 7 \quad ; \quad x = 2$$

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

Putting the values of x in equation (iii)

$$y = x - 7 \quad ; \quad y = x - 7$$

$$y = \frac{7}{2} - 7 \quad ; \quad y = 2 - 7$$

$$y = \frac{7-14}{2} \quad ; \quad y = -5$$

$$y = -\frac{7}{2} \quad ; \quad y = -5$$

So,

$$S.S = \left\{ \left(\frac{7}{2}, -\frac{7}{2} \right), (2, -5) \right\}$$

$$4. \quad x + y = a - b \quad ; \quad \frac{a}{x} - \frac{b}{y} = 2$$

$$x + y = a - b \text{ ----- (i)}$$

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

$$\frac{ay - bx}{xy} = 2$$

$$ay - bx = 2xy$$

$$ay - bx - 2xy = 0 \text{ ----- (ii)}$$

From equation (i) we have:

$$x + y = a - b$$

$$y = a - b - x$$

$$y = a - b - x \text{ ----- (iii)}$$

Putting in equation (ii)

$$ay - bx - 2xy = 0$$

$$a(a - b - x) - bx - 2x(a - b - x) = 0$$

$$a^2 - ab - ax - bx - 2ax + 2bx + 2x^2 = 0$$

$$2x^2 - 3ax + bx + a^2 - ab = 0$$

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

using quadratic formula

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

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

$$x = \frac{3a-b \pm \sqrt{(3a-b)^2 - 8(a^2-ab)}}{2(2)}$$

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

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

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

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

$$x = \frac{3a-b+(a+b)}{4} ;$$

$$x = \frac{3a-b+a+b}{4} ;$$

$$x = \frac{4a}{4} ;$$

$$x = a ;$$

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

$$x = \frac{3a-b-a-b}{4}$$

$$x = \frac{2a-2b}{4}$$

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

Putting the values of x in equation (iii)

$$y = a - b - x ;$$

$$y = a - b - a ;$$

$$y = a - b - a ;$$

$$y = -b ;$$

$$y = -b ;$$

$$y = a - b - x$$

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

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

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

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

So,

$$S.S = \left\{ (a, -b), \left(\frac{a-b}{2}, \frac{a-b}{2}\right) \right\}$$

$$5. \quad x^2 + (y-1)^2 = 10 ;$$

$$x^2 + y^2 + 4x = 1$$

$$x^2 + y^2 - 2y + 1 = 10$$

$$x^2 + y^2 - 2y = 9 \text{ ----- (i)}$$

$$x^2 + y^2 + 4x = 1 \text{ ----- (ii)}$$

Subtracting equation (i) from (ii)

$$x^2 + y^2 + 4x = 1$$

$$-x^2 - y^2 + 2y = -9$$

$$4x + 2y = -8$$

$$2x + y = -4$$

$$y = -4 - 2x \text{ ----- (iii)}$$

Putting in equation (ii)

$$x^2 + y^2 + 4x = 1$$

$$x^2 + (-4 - 2x)^2 + 4x = 1$$

$$x^2 + (-(4 + 2x))^2 + 4x = 1$$

$$x^2 + (2x + 4)^2 + 4x = 1$$

$$x^2 + 4x^2 + 16 + 16x + 4x = 1$$

$$5x^2 + 20x + 15 = 0$$

$$x^2 + 4x + 3 = 0$$

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

$$x(x + 3) + 1(x + 3) = 0$$

$$(x + 3)(x + 1) = 0$$

$$x + 3 = 0 \quad ;$$

$$x = -3 \quad ;$$

$$x + 1 = 0$$

$$x = -1$$

Putting the values of x in equation (iii)

$$y = -4 - 2x \quad ;$$

$$y = -4 - 2(-3) \quad ;$$

$$y = -4 + 6 \quad ;$$

$$y = 2 \quad ;$$

$$y = -4 - 2x$$

$$y = -4 - 2(-1)$$

$$y = -4 + 2$$

$$y = -2$$

So,

$$S.S = \{(-3, 2), (-1, -2)\}$$

$$6. \quad (x + 1)^2 + (y + 1)^2 = 5 \quad ;$$

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

$$x^2 + 2x + 1 + y^2 + 2y + 1 = 5$$

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

$$x^2 + y^2 + 2x + 2y - 3 = 0 \text{ ----- (i)}$$

$$x^2 + 4x + 4 + y^2 = 5$$

$$x^2 + y^2 + 4x - 1 = 0 \text{ ----- (ii)}$$

Subtracting equation (i) from (ii)

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

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

$$2x - 2y + 2 = 0$$

$$2x - 2y = -2$$

$$2(x - y) = -2$$

$$x - y = -1$$

$$-y = -1 - x$$

$$y = x + 1 \text{ ----- (iii)}$$

Putting in equation (ii)

$$x^2 + y^2 + 4x = 1$$

$$x^2 + (x + 1)^2 + 4x = 1$$

$$x^2 + x^2 + 2x + 1 + 4x = 1$$

$$2x^2 + 6x = 0$$

$$2x(x + 3) = 0$$

$$2x = 0 \quad ;$$

$$x = 0 \quad ;$$

$$x + 3 = 0$$

$$x = -3$$

Putting the values of x in equation (iii)

$$y = x + 1 \quad ;$$

$$y = 0 + 1 \quad ;$$

$$y = 1 \quad ;$$

$$y = x + 1$$

$$y = -3 + 1$$

$$y = -2$$

So,

$$S.S = \{(0, 1), (-3, -2)\}$$

7. $x^2 + 2y^2 = 22$; $5x^2 + y^2 = 29$

$$x^2 + 2y^2 = 22 \text{ ----- (i)}$$

$$5x^2 + y^2 = 29 \text{ ----- (ii)}$$

multiplying equation (i) by 5

$$5x^2 + 10y^2 = 110 \text{ ----- (iii)}$$

Subtracting equation (ii) from (iii)

$$5x^2 + 10y^2 = 110$$

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

$$9y^2 = 81$$

$$y^2 = 9$$

$$y = \pm 3$$

$$y = 3$$

;

$$y = -3$$

Putting the values of x in equation (i)

$$x^2 + 2y^2 = 22$$

;

$$x^2 + 2y^2 = 22$$

$$x^2 + 2(3)^2 = 22$$

;

$$x^2 + 2(-3)^2 = 22$$

$$x^2 + 2(9) = 22$$

;

$$x^2 + 2(9) = 22$$

$$x^2 + 18 = 22$$

;

$$x^2 + 18 = 22$$

$$x^2 = 4$$

;

$$x^2 = 4$$

$$x = \pm 2$$

;

$$x = \pm 2$$

So,

$$S.S = \{(\pm 2, \pm 3)\}$$

8. $4x^2 - 5y^2 = 6$; $3x^2 + y^2 = 14$

$$4x^2 - 5y^2 = 6 \text{ ----- (i)}$$

$$3x^2 + y^2 = 14 \text{ ----- (ii)}$$

multiplying equation (ii) by 5

$$15x^2 + 5y^2 = 70 \text{ ----- (iii)}$$

Adding equation (i) and (iii)

$$4x^2 - 5y^2 = 6$$

$$15x^2 + 5y^2 = 70$$

$$19x^2 = 76$$

$$x^2 = 4$$

$$x = \pm 2$$

$$x = 2 \quad ;$$

Putting the values of x in equation (i)

$$4x^2 - 5y^2 = 6 \quad ;$$

$$4(2)^2 - 5y^2 = 6 \quad ;$$

$$4(4) - 5y^2 = 6 \quad ;$$

$$16 - 5y^2 = 6 \quad ;$$

$$-5y^2 = -10 \quad ;$$

$$y^2 = 2 \quad ;$$

$$y = \pm\sqrt{2} \quad ;$$

$$x = -2$$

$$4x^2 - 5y^2 = 6$$

$$4(-2)^2 - 5y^2 = 6$$

$$4(4) - 5y^2 = 6$$

$$16 - 5y^2 = 6$$

$$-5y^2 = -10$$

$$y^2 = 2$$

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

So,

$$S.S = \{(\pm 2, \pm\sqrt{2})\}$$

9. $7x^2 - 3y^2 = 4 \quad ; \quad 2x^2 + 5y^2 = 7$

$$7x^2 - 3y^2 = 4 \text{ ----- (i)}$$

$$2x^2 + 5y^2 = 7 \text{ ----- (ii)}$$

multiplying equation (i) by 2

$$14x^2 - 6y^2 = 8 \text{ ----- (iii)}$$

multiplying equation (ii) by 7

$$14x^2 + 35y^2 = 49 \text{ ----- (iv)}$$

Subtracting equation (iii) from (iv)

$$14x^2 + 35y^2 = 49$$

$$-14x^2 + 6y^2 = -8$$

$$41y^2 = 41$$

$$y^2 = 1$$

$$y = \pm 1$$

$$y = 1 \quad ;$$

Putting the values of x in equation (i)

$$7x^2 - 3y^2 = 4 \quad ;$$

$$7x^2 - 3(1)^2 = 4 \quad ;$$

$$7x^2 - 3 = 4 \quad ;$$

$$7x^2 = 4 + 3 \quad ;$$

$$7x^2 = 7 \quad ;$$

$$x^2 = 1 \quad ;$$

$$y = -1$$

$$7x^2 - 3y^2 = 4$$

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

$$7x^2 - 3 = 4$$

$$7x^2 = 4 + 3$$

$$7x^2 = 7$$

$$x^2 = 1$$

$$x = \pm 1 \quad ; \quad x = \pm 1$$

So,

$$S.S = \{(\pm 1, \pm 1)\}$$

$$10. \quad x^2 + 2y^2 = 3 \quad ; \quad x^2 + 4xy - 5y^2 = 0$$

$$x^2 + 2y^2 = 3 \text{ ----- (i)}$$

$$x^2 + 4xy - 5y^2 = 0 \text{ ----- (ii)}$$

from equation (ii)

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

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

$$\text{so, } a=1, b=4y, c=-5y^2$$

$$\begin{aligned} x &= \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \\ &= \frac{-4y \pm \sqrt{(4y)^2 - 4(1)(-5y^2)}}{2(1)} \\ &= \frac{-4y \pm \sqrt{16y^2 + 20y^2}}{2} \\ &= \frac{-4y \pm \sqrt{36y^2}}{2} \\ &= \frac{-4y \pm 6y}{2} \end{aligned}$$

$$\begin{aligned} x &= \frac{-4y+6y}{2} \quad ; \quad x = \frac{-4y-6y}{2} \\ x &= \frac{2y}{2} \quad ; \quad x = \frac{-10y}{2} \\ x &= y \text{---(iii)} \quad ; \quad x = -5y \text{----- (iv)} \end{aligned}$$

putting the values of y in equation (i)

$$\begin{aligned} y^2 + 2y^2 &= 3 \quad ; \quad 25y^2 + 2y^2 = 3 \\ 3y^2 &= 3 \quad ; \quad 27y^2 = 3 \\ y^2 &= 1 \quad ; \quad y^2 = \frac{1}{9} \\ y &= \pm 1 \quad ; \quad y = \pm \frac{1}{9} \end{aligned}$$

Putting the values of y in equation (iii) and (iv)

$$\begin{aligned} x &= y \quad ; \quad x = -5y \\ x &= \pm 1 \quad ; \quad x = -5 \times \pm \frac{1}{9} \\ x &= \pm 1 \quad ; \quad x = \mp \frac{5}{9} \end{aligned}$$

So,

$$S.S = \left\{ (1, 1), (-1, -1), \left(\frac{5}{9}, -\frac{1}{9}\right), \left(-\frac{5}{9}, \frac{1}{9}\right) \right\}$$

$$11. \quad 3x^2 - y^2 = 26 \quad ; \quad 3x^2 - 5xy - 12y^2 = 0$$

$$3x^2 - y^2 = 26 \text{ ----- (i)}$$

$$3x^2 - 5xy - 12y^2 = 0 \text{ ----- (ii)}$$

from equation (ii)

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

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

$$\text{so, } a=3, b = -5y, c = -12y^2$$

$$\begin{aligned} x &= \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \\ &= \frac{+5y \pm \sqrt{(-5y)^2 - 4(3)(-12y^2)}}{2(3)} \\ &= \frac{5y \pm \sqrt{25y^2 + 144y^2}}{6} \\ &= \frac{5y \pm \sqrt{169y^2}}{6} \\ &= \frac{5y \pm 13y}{6} \end{aligned}$$

$$x = \frac{5y+13y}{6} ;$$

$$x = \frac{18y}{6} ;$$

$$x = 3y \text{---(iii)} ;$$

$$x = \frac{5y-13y}{6}$$

$$x = \frac{-8y}{6}$$

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

putting the values of x in equation (i)

$$3x^2 - y^2 = 26 ;$$

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

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

$$26y^2 = 26 ;$$

$$26y^2 = 26 ;$$

$$y^2 = 1 ;$$

$$y^2 = 1 ;$$

$$y^2 = 1 ;$$

$$y = \pm 1 ;$$

$$3x^2 - y^2 = 26$$

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

$$3\left(\frac{16y^2}{9}\right) - y^2 = 26$$

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

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

$$\frac{13y^2}{3} = 26$$

$$y^2 = 26 \times \frac{3}{13}$$

$$y^2 = 6$$

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

Putting the values of y in equation (iii) and (iv)

$$x = 3y ;$$

$$x = 3(\pm 1) ;$$

$$x = \pm 3 ;$$

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

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

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

So,

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

$$12. \quad x^2 + xy = 5 ; \quad y^2 + xy = 3$$

$$x^2 + xy = 5 \text{ ----- (i)}$$

$$y^2 + xy = 3 \text{ ----- (ii)}$$

Adding equation (i) and (ii)

$$x^2 + 2xy + y^2 = 8$$

$$(x + y)^2 = 8$$

taking square root on both sides

$$x + y = \pm\sqrt{8}$$

$$y = \pm 2\sqrt{2} - x \text{ ----- (iii)}$$

putting the values of y in equation (i)

$$x^2 + xy = 5$$

$$x^2 + x(\pm 2\sqrt{2} - x) = 5$$

$$x^2 \pm 2\sqrt{2}x - x^2 = 5$$

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

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

Putting the values of x in equation (iii)

$$y = \pm 2\sqrt{2} - x$$

$$y = \pm 2\sqrt{2} - \left(\pm \frac{5}{2\sqrt{2}}\right)$$

$$y = \pm 2\sqrt{2} \mp \frac{5}{2\sqrt{2}}$$

$$y = +2\sqrt{2} - \frac{5}{2\sqrt{2}} \quad ; \quad y = -2\sqrt{2} + \frac{5}{2\sqrt{2}}$$

$$y = \frac{(2\sqrt{2})^2 - 5}{2\sqrt{2}} \quad ; \quad y = \frac{-(2\sqrt{2})^2 + 5}{2\sqrt{2}}$$

$$y = \frac{8-5}{2\sqrt{2}} \quad ; \quad y = \frac{-8+5}{2\sqrt{2}}$$

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

So,

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

$$13. \quad x^2 - 2xy = 7 \quad ; \quad xy + 3y^2 = 2$$

$$x^2 - 2xy = 7 \text{ ----- (i)}$$

$$xy + 3y^2 = 2 \text{ ----- (ii)}$$

multiplying equ (i) by 2 and (ii) by 7 we get

$$2x^2 - 4xy = 14 \text{ ----- (iii)}$$

$$7xy + 21y^2 = 14 \text{ ----- (iv)}$$

subtracting (iv) from (iii)

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

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

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

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

$$x - 7y = 0 \quad ;$$

$$x = 7y \quad ;$$

$$x = 7y \text{---(v)} \quad ;$$

$$2x + 3y = 0$$

$$2x = -3y$$

$$x = -\frac{3y}{2} \text{----- (vi)}$$

put in equ (ii)

$$xy + 3y^2 = 2 \quad ;$$

$$(7y)y + 3y^2 = 2 \quad ;$$

$$7y^2 + 3y^2 = 2 \quad ;$$

$$10y^2 = 2 \quad ;$$

$$y^2 = \frac{2}{10} \quad ;$$

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

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

$$xy + 3y^2 = 2$$

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

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

$$\frac{-3y^2 + 6y^2}{2} = 2$$

$$3y^2 = 4$$

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

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

put the values in equation (v) and (vi) respectively.

$$x = 7y \quad ;$$

$$x = 7\left(\pm \frac{1}{\sqrt{5}}\right) \quad ;$$

$$x = \pm \frac{7}{\sqrt{5}} \quad ;$$

$$x = \pm \frac{7}{\sqrt{5}} \quad ;$$

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

$$x = -\frac{3}{2} \times \pm \frac{2}{\sqrt{3}}$$

$$x = \mp \frac{3}{\sqrt{3}}$$

$$x = \mp \sqrt{3}$$

So,

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