Simultaneous Linear Equations

Ex1

$$2x + 3y = 14 \quad (1)$$
$$5x + 3y = 26 \quad (2)$$

(2) − (1)

$$3x = 12$$
$$x = \frac{12}{3}$$
$$x = 4$$

Sub for x (1)

$$2(4) + 3y = 14$$
$$8 + 3y = 14$$
$$3y = 14 - 8$$
$$3y = 6$$
$$y = \frac{6}{3}$$
$$y = 2$$

Solution

$$\begin{cases} x = 4 \\ y = 2 \end{cases}$$

Ex2

$$5x + 4y = 17 \quad (1)$$
$$4x + 2y = 10 \quad (2)$$

(2) × 2

$$8x + 4y = 20 \quad (3)$$

(3) − (1)

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

Sub for x in (1)

$$5(1) + 4y = 17$$
$$5 + 4y = 17$$
$$4y = 17 - 5$$
$$4y = 12$$

Solution

$$\begin{cases} x = 1 \\ y = 3 \end{cases}$$

$$y = \frac{12}{4}$$

$$y = 3$$

Exercise Solve

1) $7x + 2y = 23$ (1)

$5x + 2y = 17$ (2)

(1) - (2) $2x = 6$

$x = \frac{6}{2}$

$\underline{x = 3}$

Sub for x in (1)

$7(3) + 2y = 23$

$21 + 2y = 23$

$2y = 23 - 21$

$2y = 2$

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

$\underline{y = 1}$

Solution

$$\begin{cases} x = 3 \\ y = 1 \end{cases}$$

2) $5x + 2y = 19$ (1)

$3x + 4y = 17$ (2)

(1) x2 $10x + 4y = 38$ (3)

(3) - (2) $7x = 21$

$x = \frac{21}{7}$

$\underline{x = 3}$

Sub for x in (1)

$5(3) + 2y = 19$

$15 + 2y = 19$

$2y = 19 - 15$

$2y = 4$

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

$y = 2$

Solution

$\begin{cases} x = 3 \\ y = 2 \end{cases}$

Ex 3

$5x + 3y = 22$ ①

$4x + 2y = 16$ ②

① × 2 $\quad 10x + 6y = 44$ ③

② × 3 $\quad 12x + 6y = 48$ ④

④ − ③ $\quad 2x = 4$

$x = \frac{4}{2}$

$\underline{x = 2}$

Sub for x in ①

$5(2) + 3y = 22$

$10 + 3y = 22$

$3y = 22 - 10$

$3y = 12$

$y = \frac{12}{3}$

$\underline{y = 4}$

Solution

$\begin{cases} x = 2 \\ y = 4 \end{cases}$

Exercise

3) $7x + 5y = 26$ ①

$4x + 2y = 14$ ②

$$(1) \times 2 \quad 14x + 10y = 52 \quad (3)$$
$$(2) \times 5 \quad 20x + 10y = 70 \quad (4)$$

$(4) - (3)$

$$6x = 18$$
$$x = \frac{18}{6}$$
$$\underline{x = 3}$$

Sub for x in (2)

$$4(3) + 2y = 14$$
$$12 + 2y = 14$$
$$2y = 14 - 12$$
$$2y = 2$$
$$y = \frac{2}{2}$$
$$\underline{y = 1}$$

Solution

$$\begin{cases} x = 3 \\ y = 1 \end{cases}$$

Exercise 2

Answers

1) $4x + 7y = 27$
$8x + 7y = 47$

$x = 5$
$y = 1$

2) $9x + 6y = 48$
$x + 2y = 8$

$x = 4$
$y = 2$

3) $5x + 2y = 21$
$4x + 3y = 21$

$x = 3$
$y = 3$
