Simultaneous Equations by Elimination

ANSWERS

1

Solve the simultaneous equations.

(1) $4x + \boxed{y} = 17$
(2) $2x + \boxed{y} = 11$
(1) − (2)

$2x = 6$
$x = 3$
(2) $6 + y = 11$
$y = 5$

$x =$ 3 , $y =$ 5
Check in (1): 12 + 5 = 17 ✓

2

Solve the simultaneous equations.

(1) $3x + \boxed{2y} = 18$
(2) $5x - \boxed{2y} = 14$
(1) + (2)

$8x = 32$
$x = 4$
(1) $12 + 2y = 18$
$2y = 6$
$y = 3$

$x =$ 4 , $y =$ 3
Check in (2): 20 − 6 = 14 ✓

3

Solve the simultaneous equations.

(1) $\boxed{2x} + 3y = 13$
(2) $\boxed{4x} + y = 11$
(1) × 2
(3) $\boxed{4x} + 6y = 26$
(3) − (2)

$5y = 15$
$y = 3$
(2) $4x + 3 = 11$
$4x = 8$
$x = 2$

$x =$ 2 , $y =$ 3
Check in (1): 4 + 9 = 13 ✓

4

Solve the simultaneous equations.

(1) $3x + \boxed{4y} = 23$
(2) $2x - \boxed{2y} = 6$
(2) × 2
(3) $4x - \boxed{4y} = 12$
(1) + (3)

$7x = 35$
$x = 5$
(2) $10 - 2y = 6$
$-2y = -4$
$y = 2$

$x =$ 5 , $y =$ 2
Check in (1): 15 + 8 = 23 ✓

5

Solve the simultaneous equations.

(1) $\boxed{3x} + 2y = 12$
(2) $\boxed{2x} + 3y = 13$
(1) × 2
(3) $\boxed{6x} + 4y = 24$
(2) × 3
(4) $\boxed{6x} + 9y = 39$
(4) − (3)

$5y = 15$
$y = 3$
(2) $2x + 9 = 13$
$2x = 4$
$x = 2$

$x =$ 2 , $y =$ 3
Check in (1): 6 + 6 = 12 ✓

6

Solve the simultaneous equations.

(1) $4x + \boxed{3y} = 6$
(2) $3x - \boxed{2y} = 13$
(1) × 2
(3) $8x + \boxed{6y} = 12$
(2) × 3
(4) $9x - \boxed{6y} = 39$
(3) + (4)

$17x = 51$
$x = 3$
(2) $9 - 2y = 13$
$-2y = 4$
$y = -2$

$x =$ 3 , $y =$ −2
Check in (1): 12 − 6 = 6 ✓

7

Lena solves these simultaneous equations.

(1) $x + 3y = 11$
(2) $2x + y = 7$

She writes (1) × 2: $2x + 6y = 11$.
Explain her mistake.
Then solve the equations.

She did not multiply the 11. (1) × 2 is 2x + 6y = 22. Then (3) − (2): 5y = 15, so y = 3 and x = 2.

Answer x = 2, y = 3

8

Jamal says $x = 4$, $y = 1$ is the solution of these equations.

(1) $3x - 2y = 10$
(2) $x + 4y = -6$

Check it in both equations.
Then find the right solution.

In (1): 12 − 2 = 10, but in (2): 4 + 4 = 8, not −6. (1) × 2, then add (2): 7x = 14, so x = 2 and y = −2.

Answer x = 2, y = −2

Simultaneous Equations by Elimination *further practice*

ANSWERS

9

Solve the simultaneous equations.

(1) $5x + 3y = 7$

(2) $3x + 2y = 5$

(1) × 2
(3) $10x + \boxed{6y} = 14$
(2) × 3
(4) $9x + \boxed{6y} = 15$
(3) − (4)
$x = -1$
(2) $-3 + 2y = 5$
$2y = 8$
$y = 4$

Answer $x = -1, y = 4$

10

Solve the simultaneous equations.

(1) $4a + 5b = 7$

(2) $3a - 2b = 11$

(1) × 2
(3) $8a + \boxed{10b} = 14$
(2) × 5
(4) $15a - \boxed{10b} = 55$
(3) + (4)
$23a = 69$
$a = 3$
(2) $9 - 2b = 11$
$-2b = 2$
$b = -1$

Answer $a = 3, b = -1$

11

Solve the simultaneous equations.

(1) $4x + y = 5$

(2) $2x + 3y = 10$

(2) × 2
(3) $\boxed{4x} + 6y = 20$
(3) − (1)
$5y = 15$
$y = 3$
(2) $2x + 9 = 10$
$2x = 1$
$x = \frac{1}{2}$

Answer $x = \frac{1}{2}, y = 3$

12

Which letter is quicker to eliminate here? Explain why. Then solve the equations.

(1) $3x + 2y = 4$

(2) $5x + 4y = 6$

y: only (1) needs multiplying (by 2)
(1) × 2
(3) $6x + \boxed{4y} = 8$
(3) − (2)
$x = 2$
(1) $6 + 2y = 4$
$2y = -2$
$y = -1$

Answer $x = 2, y = -1$

13

Ben works out (1) − (2) and gets $-3x + 6y = 12$.

(1) $2x + 3y = 13$

(2) $5x - 3y = 1$

What should he have done?
Solve the equations.

The signs are different, so add.
(1) + (2)
$7x = 14$
$x = 2$
(1) $4 + 3y = 13$
$3y = 9$
$y = 3$

Answer $x = 2, y = 3$

14

Solve the simultaneous equations.

(1) $4x - 5y = 23$

(2) $3x - 2y = 12$

(1) × 3
(3) $\boxed{12x} - 15y = 69$
(2) × 4
(4) $\boxed{12x} - 8y = 48$
(4) − (3)
$7y = -21$
$y = -3$
(2) $3x + 6 = 12$
$3x = 6$
$x = 2$

Answer $x = 2, y = -3$

15

Write a pair of simultaneous equations with the solution $x = 3, y = -1$, where you multiply one equation and then add.

For example. (1) × 3, then add.
Check: 6 − 1 = 5 and 3 + 3 = 6

Answer $2x + y = 5,\ x - 3y = 6$

16

Priya says $x = 2, y = 5$ solves these, because it works in (1).

(1) $x + y = 7$

(2) $3x - y = 5$

Explain why she is wrong.
Then solve the equations.

In (2): 6 − 5 = 1, not 5
(1) + (2)
$4x = 12$
$x = 3$
(1) $3 + y = 7$
$y = 4$

Answer $x = 3, y = 4$