

10.8 Simultaneous Linear Equations

1. Solve each of the following pairs of simultaneous equations:

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|--------------------------------------|-------------------------------------|--------------------------------------|
| (a) $x + y = 14$
$x - y = 4$ | (b) $x - y = -1$
$2x - y = 0$ | (c) $3x - y = 9$
$4x - y = -14$ |
| (d) $y - x = -1$
$3x - y = 5$ | (e) $5x + 4y = 4$
$3x + 4y = 8$ | (f) $3x + 5y = 5$
$3x + 9y = -3$ |
| (g) $3x + 2y = 0$
$-x + y = 5$ | (h) $3x - y = -2$
$x - 3y = 10$ | (i) $3x - 2y = 7$
$4x + y = 13$ |
| (j) $3a - b = 9$
$2a + 2b = 14$ | (k) $3x - 8y = 1$
$6x - 7y = 25$ | (l) $2m + 5n = 24$
$4m + 3n = 20$ |
| (m) $2x + 7y = 17$
$5x + 3y = -1$ | (n) $5u - 2v = 9$
$7u - 5v = 28$ | |

2. Solve the simultaneous equations

$$\begin{aligned}x + y &= 4 \\15x + 25y &= 76\end{aligned}$$

3. Solve the following equations:

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|---------------------------------------|--|---|
| (a) $x + y = 7$
$x - y = 3$ | (b) $x - 3y = 7$
$x - y = 3$ | (c) $3x + y = 13$
$5x - y = 35$ |
| (d) $3x + 3y = 15$
$3x - 5y = -41$ | (e) $3x + 2y + 7 = 0$
$5x - 2y + 1 = 0$ | (f) $3x + y = 17$
$3x - y = 19$ |
| (g) $3x + 2y = 8$
$2y - 5x = 8$ | (h) $2x = 5 - y$
$3y = 1 - 2x$ | (i) $7x - y + 23 = 0$
$x + 2y - 1 = 0$ |
| (j) $3x - 5y = 31$
$x + 3y = 1$ | (k) $x + 3y = 7$
$y - 4x = 11$ | (l) $3x + 7y = -15$
$x - 3y = 11$ |

4. Suvinder spends £26 on 100 postage stamps. If x of them are 20p stamps and the remaining y are 35p stamps, write down two equations in x and y and solve them.

5. Harry pays £8.50 for 5 kg of flour and 3 kg of sugar. Sarah pays £13.20 for 8 kg of flour and 4 kg of sugar. If the cost of flour is £ x per kg and the cost of sugar is £ y per kg, write down two equations in x and y and solve them.
6. John and David have £14.00 altogether. If John's money is doubled and David's tripled, they will have £34.00 altogether. How much does each boy have?
7. A retailer can buy either two television sets and three video-recorders for £3750, or four television sets and one video-recorder for £4250. What is the cost of a television set? What is the cost of a video-recorder?
8. A toothbrush and a tube of toothpaste cost £4.15; the toothbrush costs 25p less than the tube of toothpaste. Find the cost of each item.
9. A grocer wants to mix a type of spice which costs £22 per kilogram with another type which costs £12 per kilogram, to obtain 20 kilograms of mixture which will cost £15 per kilogram. What quantity of each spice must the grocer take?
10. Mrs Rogers bought 3 blouses and 2 scarves. She paid £26.
Mrs Summers bought 4 blouses and 1 scarf. She paid £28.
The cost of a blouse was x pounds.
The cost of a scarf was y pounds.
- (a) Use the information to write down two equations in x and y .
(b) Solve these equations to find the cost of one blouse.

11. Solve

$$3x - 2y = 3$$

$$x + 4y = 8$$

(Edexcel)

12. Solve the simultaneous equations

$$y = 2x + 3$$

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

You **must** show your working.

Do **not** use trial and improvement.

(AQA)