

98. Solving Simultaneous Equations Algebraically and Graphically

Practice Questions

1. Solve $x + y = 10$, $x - y = 2$.
2. Solve $2x + 3y = 12$, $x - y = 1$.
3. Solve $3x - y = 4$, $2x + y = 7$.
4. Solve $4x + y = 9$, $x - y = 3$.
5. Solve $5x - 2y = 8$, $x + y = 6$.
6. Solve $2x + y = 5$, $x - 2y = -4$.
7. Solve $x^2 + y = 10$, $x + y = 6$.
8. Solve $x^2 + y^2 = 25$, $x - y = 1$.
9. Solve $3x + 2y = 7$, $4x - y = 5$.
10. Graph the equations $y = 2x + 1$ and $y = -x + 4$. Find their intersection.

Scenario Questions

1. A café sells tea for £2 and coffee for £3. A customer spends £20 on 8 drinks. Write and solve the simultaneous equations.
2. Two taxis charge £5 plus £0.50 per mile and £3 plus £0.80 per mile. Find when they cost the same.
3. A farmer has chickens and cows. There are 30 animals in total, and they have 80 legs. Solve for how many of each.
4. A company produces x large and y small boxes. The total weight is 100kg, and there are 40 boxes. Solve for x and y .
5. A movie theatre sells adult tickets for £12 and child tickets for £8. It sells 100 tickets for £1040. Find how many of each were sold.
6. A school orders pens and pencils. There are 200 items, and the cost is £150. Solve for how many pens and pencils were bought.
7. A train journey costs £2 per stop for one line and £3 per stop for another. Find when the costs are equal.
8. A shop sells shirts for £15 and trousers for £25. The total sales were £500 from 30 items. Find how many of each were sold.
9. A car rental costs £50 plus £0.10 per mile and another £30 plus £0.20 per mile. Find when they cost the same.
10. Two joggers start at the same point. One runs at 5 km/h, and the other at 6 km/h but starts 10 minutes later. When will they meet?

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Practice Questions

1. $x = 6, y = 4$
2. $x = 3, y = 2$
3. $x = 3, y = 5$
4. $x = 2, y = 1$
5. $x = 4, y = 2$
6. $x = 2, y = 1$
7. $x = 2, y = 4$ or $x = -4, y = 10$
8. $x = 4, y = 3$ or $x = -3, y = -4$
9. $x = 2, y = 1$
10. Intersection at $x = 1, y = 3$

Scenario Questions

1. $2x + 3y = 20, x + y = 8$; $x = 4$ teas, $y = 4$ coffees
2. $5 + 0.50x = 3 + 0.80x$; $x = 6.67$ miles
3. $x + y = 30, 2x + 4y = 80$; $x = 20$ chickens, $y = 10$ cows
4. $x + y = 40, 3x + 2y = 100$; $x = 20$ large boxes, $y = 20$ small boxes
5. $12x + 8y = 1040, x + y = 100$; $x = 60$ adult tickets, $y = 40$ child tickets
6. $x + y = 200, 0.5x + 0.75y = 150$; $x = 100$ pens, $y = 100$ pencils
7. $2x = 3y$; depends on the number of stops
8. $15x + 25y = 500, x + y = 30$; $x = 10$ shirts, $y = 20$ trousers
9. $50 + 0.10x = 30 + 0.20x$; $x = 200$ miles
10. $5t = 6(t - \frac{1}{6})$; $t = 1$ hour