

Foundation GCSE: Simultaneous Equations

Name: _____

Class: _____

Instructions: Answer all questions. Questions are ordered from easiest (1) to hardest (20). Working out should be shown where appropriate.

1. Solve the simultaneous equations:

$$x + y = 7,$$

$$x - y = 3.$$

2. Solve the simultaneous equations:

$$2x + y = 11,$$

$$x + y = 7.$$

3. Solve the simultaneous equations:

$$3x + y = 10,$$

$$x + y = 4.$$

4. Solve the simultaneous equations:

$$x + 2y = 11,$$

$$x + y = 7.$$

5. Solve the simultaneous equations:

$$2x + 3y = 13,$$

$$2x + y = 7.$$

6. Solve the simultaneous equations:

$$4x + y = 14,$$

$$2x + y = 8.$$

7. Solve the simultaneous equations:

$$x - y = 2,$$

$$2x + y = 13.$$

8. Solve the simultaneous equations:

$$3x - y = 5,$$

$$x + y = 7.$$

9. Solve the simultaneous equations:

$$2x + 3y = 12,$$

$$x - 3y = -3.$$

10. Solve the simultaneous equations:

$$3x + 2y = 16,$$

$$x - 2y = 0.$$

11. Solve the simultaneous equations:

$$2x + y = 8,$$

$$x + 2y = 7.$$

12. Solve the simultaneous equations:

$$3x + y = 10,$$

$$x + 3y = 6.$$

13. Solve the simultaneous equations:

$$2x + 3y = 13,$$

$$3x + 2y = 12.$$

14. Solve the simultaneous equations:

$$4x + 5y = 18,$$

$$2x + 3y = 10.$$

15. Solve the simultaneous equations:

$$2x - y = 3,$$

$$x + 2y = 4.$$

16. Solve the simultaneous equations:

$$5x - 2y = 11,$$

$$x + 3y = 9.$$

17. Solve the simultaneous equations:

$$3x + 4y = 18,$$

$$2x - y = 1.$$

18. Solve the simultaneous equations:

$$4x - 3y = 7,$$

$$2x + 5y = 23.$$

19. Solve the simultaneous equations:

$$3x - 2y = 2,$$

$$5x + 3y = 16.$$

20. Solve the simultaneous equations:

$$4x + 3y = 17,$$

$$3x + 4y = 18.$$

Answers & Worked Solutions

1. $x = 5, \quad y = 2$
Add equations: $2x = 10 \implies x = 5$. Substitute into 1: $5 + y = 7 \implies y = 2$.
2. $x = 4, \quad y = 3$
Subtract equations: $(2x + y) - (x + y) = 11 - 7 \implies x = 4$. Then $4 + y = 7 \implies y = 3$.
3. $x = 3, \quad y = 1$
Subtract equations: $2x = 6 \implies x = 3$. Then $3 + y = 4 \implies y = 1$.
4. $x = 3, \quad y = 4$
Subtract equations: $(x + 2y) - (x + y) = 11 - 7 \implies y = 4$. Then $x + 4 = 7 \implies x = 3$.
5. $x = 2, \quad y = 3$
Subtract equations: $2y = 6 \implies y = 3$. Then $2x + 3 = 7 \implies 2x = 4 \implies x = 2$.
6. $x = 3, \quad y = 2$
Subtract equations: $2x = 6 \implies x = 3$. Then $2(3) + y = 8 \implies 6 + y = 8 \implies y = 2$.
7. $x = 5, \quad y = 3$
Add equations: $3x = 15 \implies x = 5$. Then $5 - y = 2 \implies y = 3$.
8. $x = 3, \quad y = 4$
Add equations: $4x = 12 \implies x = 3$. Then $3 + y = 7 \implies y = 4$.
9. $x = 3, \quad y = 2$
Add equations: $3x = 9 \implies x = 3$. Then $3 - 3y = -3 \implies 3y = 6 \implies y = 2$.
10. $x = 4, \quad y = 2$
Add equations: $4x = 16 \implies x = 4$. Since $x = 2y, 4 = 2y \implies y = 2$.
11. $x = 3, \quad y = 2$
Multiply eqn 1 by 2: $4x + 2y = 16$. Subtract eqn 2: $3x = 9 \implies x = 3$. Then $2(3) + y = 8 \implies y = 2$.
12. $x = 3, \quad y = 1$
Multiply eqn 1 by 3: $9x + 3y = 30$. Subtract eqn 2: $8x = 24 \implies x = 3$. Then $3(3) + y = 10 \implies y = 1$.
13. $x = 2, \quad y = 3$
Multiply eqn 1 by 3 and eqn 2 by 2: $6x + 9y = 39$ and $6x + 4y = 24$. Subtract: $5y = 15 \implies y = 3$. Then $2x + 9 = 13 \implies x = 2$.
14. $x = 2, \quad y = 2$
Multiply eqn 2 by 2: $4x + 6y = 20$. Subtract eqn 1: $y = 2$. Then $2x + 6 = 10 \implies x = 2$.
15. $x = 2, \quad y = 1$
Multiply eqn 2 by 2: $2x + 4y = 8$. Subtract eqn 1: $5y = 5 \implies y = 1$. Then $x + 2(1) = 4 \implies x = 2$.
16. $x = 3, \quad y = 2$
Multiply eqn 2 by 2: $2x + 6y = 18$. Add eqn 1: $7x = 21 \implies x = 3$. Then $3 + 3y = 9 \implies y = 2$.
17. $x = 2, \quad y = 3$
Multiply eqn 2 by 4: $8x - 4y = 4$. Add eqn 1: $11x = 22 \implies x = 2$. Then $2(2) - y = 1 \implies y = 3$.
18. $x = 4, \quad y = 3$
Multiply eqn 2 by 2: $4x + 10y = 46$. Subtract eqn 1: $13y = 39 \implies y = 3$. Then $4x - 9 = 7 \implies x = 4$.
19. $x = 2, \quad y = 2$
Multiply eqn 1 by 3 and eqn 2 by 2: $9x - 6y = 6$ and $10x + 6y = 32$. Add: $19x = 38 \implies x = 2$. Then $3(2) - 2y = 2 \implies y = 2$.
20. $x = 2, \quad y = 3$
Multiply eqn 1 by 4 and eqn 2 by 3: $16x + 12y = 68$ and $9x + 12y = 54$. Subtract: $7x = 14 \implies x = 2$. Then $4(2) + 3y = 17 \implies y = 3$.