# Simultaneous Equations questions and answers

8 questions · 6 Core, 2 Extended · 8 non-calculator · worked answers

Name _____ Date _____ Score _____

- Original questions in the style of the Cambridge 0580 papers, each labelled Core or Extended and calculator or non-calculator. Try every question before you look at the answers.
- Worked answers start after the questions. Questions with marks come from our 0580 practice bank (M method, A accuracy, B independent marks).
- Online, with more practice: igcsemathrevision.com/igcse-frontend/0580/simultaneous-equations-questions

## Core: for everyone (Papers 1 and 3, and Extended Papers 2 and 4)

**1.** **Core · non-calculator · easy**

Solve the simultaneous equations.

$x + y = 12$

$x - y = 4$

**2.** **Core · non-calculator · medium**

Solve the simultaneous equations.

$3x + 2y = 16$

$x + 2y = 8$

**3.** Core · non-calculator · medium

Solve the simultaneous equations.

$2x + 3y = 13$

$5x - 2y = 4$

**4.** Core · non-calculator · medium

Solve the simultaneous equations.

$y = 2x - 1$

$3x + 2y = 19$

**5.** Core · non-calculator · medium · 3 marks

Solve the simultaneous equations.

$2x + y = 11$

$x - y = 1$

**6.** Core · non-calculator · hard

$4$ adult tickets and $3$ child tickets cost £$55$.
$2$ adult tickets and $5$ child tickets cost £$45$.
Find the cost of an adult ticket and of a child ticket.

## Extended: for Papers 2 and 4

**7.** Extended · non-calculator · hard

Solve the simultaneous equations.
$y = x^2 - 3$
$y = 2x$

**8.** Extended · non-calculator · hard

Solve the simultaneous equations.
$x^2 + y^2 = 25$
$y = x + 1$

## Answers and worked solutions

### Question 1

**Answer:** $x = 8$, $y = 4$

1. Add the equations: $2x = 16$, so $x = 8$.
2. $8 + y = 12$, so $y = 4$.

### Question 2

**Answer:** $x = 4$, $y = 2$

1. Subtract: $2x = 8$, so $x = 4$.
2. $4 + 2y = 8$, so $y = 2$.

### Question 3

**Answer:** $x = 2$, $y = 3$

1. Multiply the first by $2$ and the second by $3$: $4x + 6y = 26$ and $15x - 6y = 12$.
2. Add: $19x = 38$, so $x = 2$.
3. $4 + 3y = 13$, so $y = 3$.

### Question 4

**Answer:** $x = 3$, $y = 5$

1. Substitute: $3x + 2(2x - 1) = 19$.
2. $7x - 2 = 19$, so $x = 3$.
3. $y = 2 \times 3 - 1 = 5$

### Question 5 — 3 marks

**Answer:** $x = 4,\ y = 3$

**M1** adds the equations: $3x = 12$, or substitutes $x = 1 + y$

**A1** $x = 4$

**A1** $y = 3$

### Question 6

**Answer:** Adult £$10$, child £$5$

1. $4a + 3c = 55$ and $2a + 5c = 45$.
2. Double the second: $4a + 10c = 90$. Subtract the first: $7c = 35$, so $c = 5$.
3. $2a + 25 = 45$, so $a = 10$.

### Question 7

**Answer:** $x = 3, y = 6$ and $x = -1, y = -2$

1. $x^2 - 3 = 2x$, so $x^2 - 2x - 3 = 0$.
2. $(x - 3)(x + 1) = 0$, so $x = 3$ or $x = -1$.
3. $y = 2x$: $y = 6$ or $y = -2$.

### Question 8

**Answer:** $x = 3, y = 4$ and $x = -4, y = -3$

1. $x^2 + (x + 1)^2 = 25$, so $2x^2 + 2x + 1 = 25$.
2. $x^2 + x - 12 = 0$, so $(x + 4)(x - 3) = 0$.
3. $x = 3, y = 4$ or $x = -4, y = -3$.

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