Solving simultaneous equations graphically/algebraically/with technology

6 questions | 12 marks

Equivalent correct methods earn the corresponding marks.

1. Solve $x + y = 13$ and $x - y = 5$. [2 marks]

Adding gives $2x = 18$; then $y = 4$.

Answer: $(9, 4)$.

2. Solve $3x + 2y = 16$ and $x - y = 2$. [2 marks]

Substitute $x = y + 2$: $5y + 6 = 16$.

Thus $y = 2$, $x = 4$.

Answer: $(4, 2)$.

3. Find where $y = 4x - 3$ meets $y = x + 6$. [2 marks]

$4x - 3 = x + 6$ gives $x = 3$; then $y = 9$.

Answer: $(3, 9)$.

4. How many solutions do $x + 2y = 6$ and $2x + 4y = 15$ have? [2 marks]

Doubling the first requires $2x + 4y = 12$, which contradicts 15.

Answer: None.

5. How many solutions do $3x - y = 8$ and $6x - 2y = 16$ have? [2 marks]

The second equation is twice the first, so they describe the same line.

Answer: Infinitely many.

6. A solver returns $(2, 5)$ for $4x - y = 3$ and $x + 3y = 17$. Verify it. [2 marks]

$4(2) - 5 = 3$ and $2 + 3(5) = 17$.

Answer: Correct.