Simultaneous equations: 10 practice questions

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Name: _____ Date: _____

Attempt all questions and show your working. Suggested time: 15 to 20 minutes.

Section A: Consolidating (Questions 1-4)

Question 1

(a) Is (2, 3) a solution of the pair of equations x + y = 5 and 2x - y = 1? Show how you know.

(b) Is (1, 4) a solution of the same pair of equations? Show how you know.

Question 2

Solve using substitution.

y = 2x x + y = 12

Question 3

Solve using elimination.

x + y = 10 x - y = 4

Question 4

(a) Copy and complete the table for the lines y = x + 3 and y = 9 - x.

x	0	1	2	3	4
y = x + 3					
y = 9 - x					

(b) Use the table to write the point where the two lines meet.

Section B: Standard (Questions 5-10)

Question 5

Solve each pair of equations using substitution.

(a) y = x + 2 and 3x + y = 18

(b) x = 2y - 1 and 3x - 4y = 5

Question 6

Solve each pair of equations using elimination.

(a) 2x + 3y = 13 and 2x - y = 1

(b) 3x + 2y = 16 and 5x - 2y = 0

Question 7

Solve each pair of equations using elimination. You will need to multiply one or both equations first.

(a) 3x + 2y = 12 and x + 4y = 14

(b) 4x + 3y = 6 and 3x - 2y = 13

Question 8

(a) Copy and complete the table of values.

x	-1	0	1	2	3	4
y = 2x - 1						
y = -x + 5						

(b) Draw both lines on the same set of axes, using x values from -1 to 4.

(c) Use your graph to find the point of intersection, and check it algebraically.

Question 9

Two straight lines are drawn on a set of axes. Line A passes through the points (0, 1) and (4, 9). Line B passes through the points (0, 7) and (6, 1).

(a) Find the equation of each line.

(b) Find the point where the lines cross.

Question 10

For each pair of equations, state whether there is no solution, exactly one solution or infinitely many solutions. Explain your answer by describing the graphs.

(a) y = 3x + 2 and y = 3x - 4

(b) 2x + y = 5 and 4x + 2y = 10

(c) y = x + 1 and y = -2x + 7

Simultaneous equations: answers

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Question 1

Answer: (a) Yes: 2 + 3 = 5 and 2(2) - 3 = 1 (b) No: 1 + 4 = 5 but 2(1) - 4 = -2, not 1

Question 2

Answer: x = 4, y = 8

Question 3

Answer: x = 7, y = 3

Question 4

Answer: (a) y = x + 3: 3, 4, 5, 6, 7; y = 9 - x: 9, 8, 7, 6, 5 (b) (3, 6)

Question 5

Answer: (a) x = 4, y = 6 (b) x = 7, y = 4

Question 6

Answer: (a) x = 2, y = 3 (b) x = 2, y = 5

Question 7

Answer: (a) x = 2, y = 3 (b) x = 3, y = -2

Question 8

Answer: (a) y = 2x - 1: -3, -1, 1, 3, 5, 7; y = -x + 5: 6, 5, 4, 3, 2, 1 (b) two straight lines through these points (c) (2, 3) (2x - 1 = -x + 5 gives x = 2)

Question 9

Answer: (a) Line A: y = 2x + 1; Line B: y = -x + 7 (b) (2, 5)

Question 10

Answer: (a) No solution: same gradient, different y-intercepts, so the lines are parallel and never meet (b) Infinitely many: the second equation is double the first, so both are the same line (c) Exactly one, at (2, 3): different gradients, so the lines cross once