FOUNDATION & HIGHER

HIGHER EXTENDS

Name ..... Class .....

A19: Simultaneous equations

Reason with solving simultaneous equations

20 marks · 25 minutes · Non-calculator

1) Show that $x = 3$, $y = 2$ satisfies both $2x + y = 8$ and $x - y = 1$

[Question 1: 2 marks]

2) Explain why $y = 2x + 1$ and $y = 2x + 5$ have no common solution.

.....

.....

[Question 2: 2 marks]

3) Show that the solution of $3x + 2y = 12$ and $x + 2y = 8$ is $x = 2, y = 3$

[Question 3: 3 marks]

4) Kim adds $2x + 3y = 13$ and $2x - y = 1$ to eliminate x. Explain her mistake and solve the equations.

.....

.....

.....

[Question 4: 3 marks]

5) Show that $y = x^2$ and $y = x + 2$ meet at $(2, 4)$ and $(-1, 1)$

[Question 5: 3 marks]

6) Explain what the solution of two simultaneous equations represents on a graph.

.....

[Question 6: 1 marks]

7) 2 adult tickets and 3 child tickets cost £26. 1 adult ticket and 2 child tickets cost £15. Show that an adult ticket costs £7 and a child ticket costs £4.

[Question 7: 3 marks]

8) Show that the line $y = 2x - 1$ touches the curve $y = x^2$ at exactly one point.

.....

.....

.....

[Question 8: 3 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	Shown	$6 + 2 = 8$ and $3 - 2 = 1$ (M1); C1.
2	Explanation	Parallel lines, same gradient (C1); different intercepts, so never meet (C1).
3	Shown	Subtract: $2x = 4$ (M1); $x = 2$ (A1); $y = 3$ (C1).
4	$x = 2$, $y = 3$	Should subtract as the x terms have the same sign (C1); $4y = 12$ (M1); C1.
5	Shown	$x^2 - x - 2 = 0$ (M1); $(x - 2)(x + 1)$ (M1); C1.
6	Explanation	The point where the graphs meet (C1).
7	Shown	$2a + 3c = 26$, $a + 2c = 15$ (M1); eliminate (M1); C1.
8	Shown	$x^2 - 2x + 1 = 0$ (M1); $(x - 1)^2 = 0$ (M1); one repeated root (C1).