

Simultaneous Equations Exam Questions MS (from OCR 4721)

Q1, (Jun 2010, Q7)

$2(6-2y)^2 + y^2 = 57$	M1*	substitute for x/y or attempt to get an equation in 1 variable only
	A1	correct unsimplified expression
$2(36-24y+4y^2) + y^2 = 57$		
$9y^2 - 48y + 15 = 0$	A1	obtain correct 3 term quadratic
$3y^2 - 16y + 5 = 0$		
$(3y-1)(y-5) = 0$	M1	correct method to solve 3 term quadratic
$y = \frac{1}{3}$ or $y = 5$	dep	
	A1	
$x = \frac{16}{3}$ or $x = -4$	A1	
		6 SC If A0 A0, one correct pair of values, spotted or from correct factorisation www
		6 B1

Q2, (Jun 2011, Q4)

$2x^2 - 8x + 8 = 26 - 3x$	M1	Attempt to eliminate x or y
$2x^2 - 5x - 18(= 0)$	A1	Correct 3 term quadratic (not necessarily all in one side)
$(2x-9)(x+2)(= 0)$	M1	Correct method to solve quadratic
$x = \frac{9}{2}, x = -2$	A1	x values correct
$y = \frac{25}{2}, y = 32$	A1	5 y values correct
	5	SR If A0 A0, one correct pair of values, spotted or from correct factorisation www B1

Q3, (Jan 2013, Q4)

(i)	$2x^2 - 3x - 5 = \frac{-10x - 11}{2}$ $4x^2 + 4x + 1 = 0$ $(2x + 1)(2x + 1) = 0$ $x = -\frac{1}{2}$ $y = -3$	*M1	Substitute for x/y or attempt to get an equation in 1 variable only
		A1	Obtain correct 3 term quadratic – could be a multiple e.g. $2x^2 + 2x + 0.5 = 0$
		DM1	Correct method to solve resulting 3 term quadratic
		A1	
		A1	
		[5]	
(ii)	Line is a tangent to the curve	B1 √	Must be consistent with their answers to their quadratic in (i). 1 repeated root – indicates one point. Accept tangent, meet at, intersect, touch etc. but do not accept cross 2 roots – indicates meet at two points 0 roots – indicates do not meet. Do not accept “do not cross”
		[1]	

Q4, (Jun 2015, Q6)

$$x^2 - (5 - 2x)^2 = 3$$

$$3x^2 - 20x + 28 = 0$$

$$(3x - 14)(x - 2) = 0$$

$$x = \frac{14}{3}, x = 2$$

$$y = -\frac{13}{3}, y = 1$$

M1*	Substitute for x/y or valid attempt to eliminate one of the variables
A1	Three term quadratic in solvable form
M1dep	Correct method to solve three term quadratic – see appendix 1
A1	Both x values correct
A1 [5]	Both y values correct. Allow 1 A mark for one correct pair of x and y from correct factorisation.

Q5, (Jun 2016, Q3)

$$x^2 + (3x + 4)^2 = 34$$

$$10x^2 + 24x - 18 = 0$$

$$5x^2 + 12x - 9 = 0$$

$$(5x - 3)(x + 3) = 0$$

$$x = \frac{3}{5}, x = -3$$

$$y = \frac{29}{5}, y = -5$$

M1*	Substitute for x/y or valid attempt to eliminate one of the variables
A1	Correct three term quadratic in solvable form
M1dep*	Attempt to solve resulting three term quadratic
A1	Correct x values
A1 [5]	Correct y values