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 dep**		correct method to solve 3 term quadratic
$y=\frac{1}{3}$ or $y=5$	**A1**		
$x=\frac{16}{3}$ or $x=$ -4	**A1**	**6** **6**	**SC** If A0 A0, one correct pair of values, spotted or from correct factorisation **www 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)		$2x^2-3x-5=\frac{-10x-11}{2}$	*M1	Substitute for x/y or attempt to get an equation in 1 variable only
		$4x^2+4x+1=0$	A1	Obtain correct 3 term quadratic – could be a multiple e.g. $2x^2+2x+0.5=0$
		$(2x+1)(2x+1)=0$	DM1	Correct method to solve resulting 3 term quadratic
		$x=-\frac{1}{2}$	A1	
		$y=-3$	A1 **[5]**	
(ii)		Line is a tangent to the curve	B1√ **[1]**	**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"

Q4, (Jun 2015, Q6)

$x^2 - (5-2x)^2 = 3$	M1*	Substitute for x/y or valid attempt to eliminate one of the variables
$3x^2 - 20x + 28 = 0$	A1	Three term quadratic in solvable form
$(3x-14)(x-2) = 0$	M1dep	Correct method to solve three term quadratic – **see appendix 1**
$x = \frac{14}{3}, x = 2$	A1	Both x values correct
$y = -\frac{13}{3}, y = 1$	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)

$x^2 + (3x+4)^2 = 34$	**M1***	Substitute for x/y or valid attempt to eliminate one of the variables
$10x^2 + 24x - 18 = 0$ $5x^2 + 12x - 9 = 0$	**A1**	Correct three term quadratic in solvable form
$(5x-3)(x+3) = 0$	**M1dep***	Attempt to solve resulting three term quadratic
$x = \frac{3}{5}, x = -3$	**A1**	Correct x values
$y = \frac{29}{5}, y = -5$	**A1** **[5]**	Correct y values