Mark scheme

Simultaneous equations

Mathematics 0580 · Questions from Paper 1, Paper 2, Paper 3 and Pape…

Total marks

38

MARKS FOR EACH QUESTION

1	2	3	4	5	6	7	8	9	10	Total
2	2	3	3	4	4	4	5	5	6	**38**

Question 1 [2]

1	$x = 10$ $y = -5$	**2**	**B1** for each

Question 2 [2]

2	$[x =]$ 4 $[y =] -1$	**2**	**B1** for each

Question 3 [3]

3	Correctly eliminating one variable $[x =] -1$ and $[y =] 5$	**M1** **A1** **A1**	 If zero scored, **SC1** for 2 values that satisfy one of the original equations **or** **SC1** if no working shown, but 2 correct answers given

Question 4 [3]

4	0 and –3	**3**	**B2** for $x^2 + 3x$ [= 0] or better or **M1** for $10 - 6x = x^2 - 3x + 10$ oe or for correct simplification of *their* quadratic to the form $ax^2 + bx + c$ [= 0] or better or finding $y = 28$ and $y = 10$

STEM | Exam Builder

Question 5 **[4]**

5	$[t=]0.5$ $[w=]-3$	**4**	**M1** for correctly equating one set of coefficients **M1** for correct method to eliminate one variable OR **M1** for making t or w the subject of one equation **M1** for substitution of t or w from *their* rearranged equation **A1** for $t=0.5$ **A1** for $w=-3$ If A0 scored **SC1** for 2 values satisfying one of the original equations

Question 6 **[4]**

6	(2, 3) and (–2, –1)	**4**	**B3** for $x = 2$ and $x = -2$ or **B2** for $x^2-4[=0]$ or better or for (2, 3) or (–2, –1) or **M1** for $x+1=x^2+x-3$ oe

Question 7 **[4]**

7	Correctly equating one set of coefficients	**M1**	
	Correct method to eliminate one variable	**M1**	
	$x = 10$, $y = -2$	**A2**	**A1** for $x = 10$ **A1** for $y = -2$ If M0 scored **SC1** for 2 values satisfying one of the original equations.

STEM Exam Builder

Question 8 **[5]**

8	$15a + 10p = 42.5$ oe $4a + 5p = 16$ oe	**2**	**B1** for each
	[*apple* =] 1.5[0] cao [*pear* =] 2[.00] cao	**3**	**M1FT** for correctly eliminating one variable from *their* equations. **A1** for 1.5 **A1** for 2 If M1 A0 or M0 scored, **SC1** for two positive costs which satisfy one of original conditions

Question 9 **[5]**

9	$4x^2 + 3x - 85[= 0]$ or $16y^2 - 113y + 7[= 0]$ oe simplified	**M2**	**M1** for $4(x^2 - 18) + 3x = 13$ or $x^2 - 18 = \frac{13 - 3x}{4}$ or $y = \left(\frac{13 - 4y}{3}\right)^2 - 18$ oe or better
	correct method to solve *their* quadratic equation e.g. factors, quadratic formula, completing the square	**M1**	$\frac{-3 \pm \sqrt{3^2 - 4 \times 4 \times -85}}{2 \times 4}$ oe, $(4x - 17)(x + 5)$ $\frac{-(-113) \pm \sqrt{(-113)^2 - 4 \times 16 \times 7}}{2 \times 16}$ oe, $(16y - 1)(y - 7)$
	$x = -5$ $y = 7$ $x = \frac{17}{4}$ oe $y = \frac{1}{16}$ oe	**B2**	**B1** for one correct pair or two correct x values or two correct y values If B0 scored and at least 2 method marks scored, **SC1** for correct substitution of both of their x values or their y values into $4y + 3x = 13$ or $y = x^2 - 18$

Question 10 **[6]**

10(a)	450	**1**	
10(b)	$10p + 3n = 525$	**2**	**M1** for $10p + 3n$
10(c)	for correctly eliminating one variable	**M1**	**FT**
	[p] = 30	**A1**	
	[n] = 75	**A1**	If 0 scored, **SC1** for 2 values satisfying one of the original equations or **SC1** for both correct but no working

STEM | Exam Builder