

Simultaneous Equation IGCSE Past Paper Answers Edexcel - Calculator

1.

Question	Working	Answer	Mark	AO	Notes
	$3x + y = 13$ or $6x + 2y = 26$ $- 3x - 6y = 27$ + $x - 2y = 9$ eg. $3x - 2 = 13$ or $15 + y = 13$	5, -2	3	AO1	M1 multiplication of one equation with correct operation selected or rearrangement of one equation with substitution into second M1 (dep) correct method to find second variable A1 for both solutions dependent on correct working

2.

Question	Working	Answer	Mark	Notes
	eg $7x + 7y = 105$ - $5x + 5y = 75$ + $7x - 5y = 3$ $7x - 5y = 3$ $7(15 - y) - 5y = 3$ or $7x - 5(15 - x) = 3$ oe		3	M1 Correct method to eliminate x or y: coefficients of x or y the same and correct operation to eliminate selected variable (condone any one arithmetic error in multiplication) or writing x or y in terms of the other variable and correctly substituting
	$"6.5" + y = 15$ or $x + "8.5" = 15$ or $7 \times "6.5" - 5y = 3$ or $7x - 5 \times "8.5" = 3$			M1 dep Correct method to find second variable using their value from a correct method to find first variable or for repeating above method to find second variable
		$x = 6.5, y = 8.5$		A1oe dep on first M1
Total 3 marks				

3.

	Eg $9x = 22.5$ or $18y = 27$ or $-18y = -27$ or $5x - (13 - 4x) = 9.5$ or $4x + 5x - 9.5 = 13$ or $5\left(\frac{13-2y}{4}\right) - 2y = 9.5$ or $4\left(\frac{9.5+2y}{5}\right) + 2y = 13$		3	M1 For a complete method to eliminate one variable (condone one arithmetic error)
	Eg $5 \times "2.5" - 2y = 9.5$ or $5x - 2 \times "1.5" = 9.5$			M1 Dep on M1 For substituting the other variable or starting again to eliminate the other variable
		$x = 2.5, y = 1.5$		A1 dep on M1 NB: candidates showing no correct working score 0 marks.
Total 3 marks				

4.

	$12x + 9y = 18$ $20x + 15y = 30$ $12x + 20y = -4$ $9x + 15y = -3$ $(11y = -22)$ $(11x = 33)$		4	M1 for coefficients of x or y the same with the correct operation to eliminate one variable (allow one error) or for correct rearrangement of one equation followed by substitution in the other.
	$y = -2$ $x = 3$ $4x + 3 \times -2 = 6$ $4 \times 3 + 3y = 6$			A1 (dep on M1)
		$x = 3, y = -2$		M1 (dep on M1) for substituting for the other variable or starting again to eliminate the other variable
				A1 (dep on M1, M1)
Total 4 marks				

5.

Question	Working	Answer	Mark	Notes
	eg. $12x + 8y = 28$ $- 12x - 9y = 45$	eg. $9x + 6y = 21$ $+ 8x - 6y = 30$		M1 for coefficient of x or y the same and correct operation to eliminate selected (condone any one arithmetic error in multiplication) or for correct rearrangement of one equation followed by correct substitution in the other
	$y = -1$ Substitution of their found value above into one of the equations	$x = 3$		A1 cao dep on M1 M1 (dep on 1st M1) for substituting to find the other variable or correct method of elimination to find second variable (as first M1)
		$x = 3; y = -1$	4	A1 cao Award 4 marks for correct values if at least first M1 scored
				Total 4 marks

6.

(a)	$10x + 6y = 18$ $21x - 6y = 75$	$35x + 21y = 63$ $35x - 10y = 125$		4	M1 for coefficients of x or y the same or for correct rearrangement of one equation followed by substitution in the other eg $5x + 3\left(\frac{7x - 25}{2}\right) = 9$
	$x = 3$ eg $5 \times 3 + 3y = 9$	$y = -2$			A1 M1 (dep on first M1) for substituting for the other variable
			3	-2	A1 cao dep Award full marks for correct values if at least first M1 scored
(b)			3	-2	1 B1 ft from (a)
					Total 5 marks

7.

$2a = -4$ or $4b = 14$		$a = -2$ $b = 3.5$	3	M1 Correctly eliminate 1 variable: Accept $3(5 - 2b) + 2b = 1$ oe A1 A1 Ans dep on M1 Ans only or T&E = M0A0A0
				Total 3 marks

8.

Question	Working	Answer	Mark	Notes
	e.g. $4x + 5y = 4$ $4x - 2y = 18$ with the operation of subtraction $4x + 5y = 4$ $10x - 5y = 45$ With the operation of adding $y = 2x - 9$ and $4x + 5(2x - 9) = 4$	$x = 3.5$ oe, $y = -2$	3	M1 for correct method to eliminate one variable – multiplying one or both equations so the coefficient of x or y is the same in both with the intention to add or subtract to eliminate one variable (condone one arithmetic error) or isolating x or y in one equation and substituting into the other equation M1 (dep) for substitution of found variable into one equation or correct method to eliminate second variable A1 Dep on M1

9.

$x^2 + (3 - 2x)^2 = 18$ $9 - 6x - 6x + 4x^2$ $5x^2 - 12x - 9 (= 0)$ $(5x + 3)(x - 3) (= 0)$ or $\frac{- -12 \pm \sqrt{(-12)^2 - 4 \times 5 \times -9}}{2 \times 5}$ $x = 3$ and $x = -0.6$	$x = 3, y = -3$ and $x = -0.6, y = 4.2$	6	<p>M1 for elimination of one variable e.g. $y^2 + \left(\frac{3-y}{2}\right)^2 = 18$</p> <p>M1 indep for correct expansion e.g. $\frac{y^2 - 3y - 3y + 9}{4}$</p> <p>A1 for correct simplified quadratic equation (terms may not all be 'on the same side') e.g. $5y^2 - 6y - 63 (= 0)$ NB dep on first M1</p> <p>M1 ft if first M1 awarded and equation is a 3 term quadratic for correct factorisation or correct substitution into formula e.g. $(5y - 21)(y + 3) = 0$ or $\frac{- -6 \pm \sqrt{(-6)^2 - 4 \times 5 \times -63}}{2 \times 5}$</p> <p>A1 or $y = -3$ and $y = 4.2$ correct x or y values implies previous M1 dep on first A1 awarded</p> <p>A1 Values for x and y must be correctly paired dep on first A1 awarded</p>
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10.

10	Eg $8y - 2y = 18 - 33$ or $10y = -15$ or $-2y - 8y = 33 - 18$ or $-10y = 15$ or $25x = 150$ or $5x + 4(5x - 33) = 18$ or $33 + 2y + 8y = 18$ or $18 - 8y - 2y = 33$		3	M1 For a correct method to find an equation in x or y. Allow one arithmetical error.
	Eg $5 \times 6 - 2y = 33$ or $5 \times 6 + 8y = 18$ or $5x - 2 \times -1.5 = 33$ or $5x + 8 \times -1.5 = 18$			M1 For a correct substitution Dep on first M1 awarded
		$x = 6, y = -1.5$		A1 oe dep on M1
				Total 3 mark