Oxford Revise | Edexcel A Level Maths | Answers

- Method (**M**) marks are awarded for showing you know a method and have attempted to apply it.
- Accuracy (**A**) marks should only be awarded if the relevant M marks have been awarded.
- Unconditional accuracy (**B**) marks are awarded independently of M marks. They do not rely on method.
- The abbreviation **o.e.** means 'or equivalent (and appropriate)'.

Please note that:

- efficient use of advanced calculators is expected
- inexact numerical answers should be given to three significant figures unless the question states otherwise; values from statistical tables should be quoted in full
- when a value of g is required, it is taken as $g = 9.8\ \text{m s}^{-2}$ unless stated otherwise in the question.

Chapter 8 Equation of a straight line

Question	Answer	Extra information	Marks
8.1 (a)	$\frac{12-4}{7-3}=2$	Finding the gradient of L_1	M1
	$y-4=2(x-3)$	Correct substitution	M1
	$y=2x-2$	Correct simplification	A1
8.1 (b)	$y-(-2)=2[x-(-3)]$ so $y+2=2(x+3)$	Correct substitution	M1
	(Alternatively: $y=2x+c$, $-2=-6+c$, so $c=4$)		
	$y=2x+4$	Correct simplification	A1
	Total		**5 marks**

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Question	Answer	Extra information	Marks
8.2 (a)	$y - 5 = -1.5[x - (-2)]$ $1.5x + y = 2$ $3x + 2y = 4$	Correct substitution Correct simplification	M1 A1
8.2 (b)	Perpendicular gradient = $\frac{2}{3}$ $y + 3 = \frac{2}{3}[x - (-1)]$ $y = \frac{2}{3}x - 2\frac{1}{3}$	Identifying gradient Correct substitution Correct rearrangement	M1 M1 A1
	Total		**5 marks**
8.3 (a)	When $y = 0$, $2x - 12 = 0$ $x = 6$ so A has coordinates $(6, 0)$ When $x = 0$, $3y - 12 = 0$ $y = 4$ so B has coordinates $(0, 4)$	Correct x-intercept Correct y-intercept	B1 B1
8.3 (b)	Area = $\frac{1}{2} \times 6 \times 4$ $= 12$	Substituting into area of triangle formula. Can be implied from correct answer. Correct area	M1 A1
	Total		**4 marks**

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Question	Answer	Extra information	Marks
8.4 (a)	$m = \frac{4-(-1)}{10-(-2)} = \frac{5}{12}$	Finding the gradient of the line	B1
	$y - 4 = \frac{5}{12}(x - 10)$	Attempting to find the equation of the line with correct substitution	M1
	$y = \frac{5}{12}x - \frac{1}{6}$	Equation of line in correct form	A1
8.4 (b)	When $x = 5$ $y = \frac{5}{12} \times 5 - \frac{1}{6}$ $= 1\frac{11}{12}$	Substituting $x = 5$	M1
	No, the line L does not pass through (5, 2)	Correct conclusion	A1
	Total		**5 marks**
8.5	Line L_1: $2y - x = 4$ has a gradient of $\frac{1}{2}$	Identifying gradient of L_1	M1
	Line L_2: $m = \frac{5-(-2)}{-5-9} = \frac{7}{-14} = -\frac{1}{2}$	Identifying gradient of L_2	M1
	Lines L_1 and L_2 are neither parallel nor perpendicular, as their gradients are not equal, and their product does not equal –1	Correct conclusion	A1
	Total		**3 marks**

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Question	Answer	Extra information	Marks
8.6	$x = 1.8x + 32$ $0.8x = -32$ $x = -40$	Setting both variables equal Solving the equation	M1 A1
	Total		**2 marks**
8.7 (a)	When $n = 0$, $P = 163$ and when $n = 5$, $P = 197$ Gradient $= \frac{197-163}{5} = \frac{34}{5} = 6.8$ Therefore, $P = 6.8n + 163$	 Finding gradient Writing the equation in the form $y = mx + c$	 M1 M1A1
8.7 (b)	When $n = 10$, $P = 6.8 \times 10 + 163 = 231$ The model gives the price of a house in 2020 as £231 000, which rounds to £230 000 to 2 s.f. so the model is suitable.	Using the model to predict the price in 2020 Conclusion based on the value predicted by their model	M1A1 A1
	Total		**6 marks**
8.8 (a)	Line L_1: $y - 4 = 2(x - 3)$ has a gradient of 2 Line L_2: $y - 7 = -3(x - 7)$ has a gradient of -3	Both gradients required for mark	B1
8.8 (b)	$2(x - 3) + 4 = -3(x - 7) + 7$ $2x - 6 + 4 = -3x + 21 + 7$ $5x = 30$ $x = 6$ $y - 4 = 2(6 - 3)$ $y = 12 - 6 + 4 = 10$, so the point P is (6, 10)	Forming an equation Attempting to solve equation Substituting for x Correct solution	M1 M1 M1 A1

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Question	Answer	Extra information	Marks
8.8 (c)	Substituting $y = 0$ into L_1 or L_2: $x = 1$ at A, $x = \frac{28}{3}$ at B Area $= \frac{1}{2} \times \left(\frac{28}{3} - 1 \right) \times 10$ $= \frac{125}{3}$	Attempting to find x-coordinates by substituting $y = 0$ into L_1 or L_2 Correctly finding both coordinates Correct method for area using the difference between the x-intercepts as the base Correct area found, as simplified improper fraction	M1 A1 M1 A1
	Total		**9 marks**
8.9 (a)	$y = kx + c$ o.e.	Statement of standard linear model	B1
8.9 (b)	$15 \times 7.50 - 15k - c = 43.25 \rightarrow 15k + c = 69.25$ o.e. $3 \times 7.50 - 3k - c = -13.75 \rightarrow 3k + c = 36.25$ o.e. $c = 28$ and $k = 2.75$ Therefore, $y = 2.75x + 28$	Substitution for 15 people Substitution for 3 people Correctly obtaining given answer	M1 M1 A1
8.9 (c)	It is the cost of renting the room.	Correct interpretation	B1
8.9 (d)	$7.50n - 2.75n - 28 = 0$ $4.75n = 28$ $n = 5.89$, therefore the teacher needs 6 people to make a profit.	Correct equation Correct solution and rounding up to the nearest whole number	M1 A1
	Total		**7 marks**

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Question	Answer	Extra information	Marks
8.10 (a)	$\frac{3k-10}{1-k} \times \frac{k+2}{k} = -1$ $\frac{(k+2)(3k-10)}{k(1-k)} = -1$ $(k+2)(3k-10) = k(k-1)$ $3k^2 - 10k + 6k - 20 = k^2 - k$		
	$2k^2 - 3k - 20 = 0$	Deriving a quadratic	M1
	$(2k+5)(k-4) = 0$	Attempting to solve the quadratic. Can be implied from sight of $-\frac{5}{2}$ and 4	M1
	$k = -\frac{5}{2}$ or $k = 4$		
	Since $k > 0$, then $k = 4$	Correct k	A1

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Question	Answer	Extra information	Marks
8.10 (b)	Line L_1: $\frac{3k-10}{1-k}=\frac{12-10}{1-4}$ $=\frac{2}{-3}$ $=-\frac{2}{3}$	Finding one gradient by substitution	B1
	Line L_2: $\frac{k+2}{k}=\frac{4+2}{4}$ $=\frac{6}{4}$ $=\frac{3}{2}$	Finding the other gradient by substitution or by stating that it is the negative reciprocal of their other gradient and therefore $\frac{3}{2}$	B1
	Total		**6 marks**

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Question	Answer	Extra information	Marks
8.11	$y = 2x + c$ $0 = 2 \times 1 + c$ $c = -2$ $y = 2x - 2$	Finding the equation of L_1	M1
	$y = -0.5x + c$ $0 = -0.5 \times 16 + c$ $c = 8$ $y = -0.5x + 8$	Finding the equation of L_2	M1
	$2x - 2 = -0.5x + 8$ $2.5x = 10$ $x = 4$ $y = 2 \times 4 - 2$ $= 6$	Finding the coordinates of the interception point	M1
	Area $= 0.5 \times (16 - 1) \times 6$ $= 45$	Finding the area of the triangle using the y-coordinate of the intercept as the height	A1
	Total		**4 marks**
8.12 (a)	$f(x) \geq -6$	Substituting $x = 4$ because this gives the minimum value of the function	B1

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Question	Answer	Extra information	Marks
8.12 (b)	$y = (x-4)^2 - 6$ $y + 6 = (x-4)^2$ $x - 4 = \sqrt{y+6}$ $x = 4 + \sqrt{y+6}$ $f^{-1}(x) = 4 + \sqrt{x+6}$	Completing the square Correct inverse	M1 A1
8.12 (c)	$f^{-1}(x) \geq 4$	Correct range. Range of inverse is the domain of the original function.	B1
	Total		**4 marks**
8.13 (a)	$h = ka$ and $h = \frac{K}{p}$ Therefore, $ka = \frac{K}{p}$ $p = \frac{\left(\frac{K}{k}\right)}{a} = \frac{\text{a constant}}{a}$, so a is inversely proportional to p	Stating two valid equations Equating Rearranging to produce result	M1 M1 A1
8.13 (b)	$a = 14ph$	The area painted is 14 square metres per person multiplied by the number of hours they work	B1
8.13 (c)	$490 = 14 \times 7 \times h$ $h = 5$ (hours)	Substituting a and p to find h Correct result	M1 A1
	Total		**6 marks**

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Question	Answer	Extra information	Marks
8.14 (a)	$(x + 2)(x – 1) > 0$ $x < –2$ and $x > 1$ or $\{x: x < –2\} \cup \{x: x > 1\}$	Factorising the expression Correct range; can be written in set notation	M1 A1
8.14 (b)	$–4 < x < 5$ or $\{x: –4 < x < 5\}$	Correct range; can be written in set notation	B1
8.14 (c)	$–4 < x < –2$ and $1 < x < 5$ or $\{x: –4 < x < –2\} \cup \{x: 1 < x < 5\}$	Correct overlap of the two ranges; can be written in set notation	B1
	Total		**4 marks**

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