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 m s^{-2} unless stated otherwise in the question.

Chapter 29 Correlation and regression

Question	Answer	Extra information	Marks
29.1 (a)	The student is incorrect. There is negative correlation, but this value does not tell us anything about how strong the correlation is.	Need conclusion and reason	B1
29.1 (b)	$d = 15 - 0.9 \times 5$ $\quad = 10.\,5$ (m)	Correct substitution Correct answer	M1 A1
29.1 (c)	Unreliable since extrapolation	Need conclusion and reason	B1
	Total		**4 marks**
29.2 (a)(i)	Correlation between two variables does not mean there is a causal relationship.	Explanation of non-causal relationships	B1

Question	Answer	Extra information	Marks
29.2 (a)(ii)	Hurn and Heathrow are close geographically, so the temperature is likely to be similar in both.	Use of knowledge of locations from large data set	B1
29.2 (b)	0.76	Correct answer	B1
29.2 (c)	For each increase of 1 °C in mean temperature at Hurn, expect an increase of 0.665 °C in mean temperature at Heathrow.	Need values and units as shown	B1
	Total		**4 marks**
29.3 (a)	decametres	Also allow 'dam'	B1
29.3 (b)	Daily (maximum relative) humidity since this can cause a change in the visibility.	Also allow 'since shown on x-axis'	B1
29.3 (c)	As the humidity increases, the visibility decreases.	Do not allow 'negative correlation'. Must interpret in context.	B1
29.3 (d)	$3175 + 1.5(3175 - 1325)$ $6000 > 5950$ so is an outlier	Substituting into rule given for upper limit Correct conclusion	M1 A1
	Total		**5 marks**
29.4 (a)	–0.858	Correct answer	B1
29.4 (b)	It is suitable since the PMCC is close to –1	Correct answer with reason	B1
29.4 (c)	The sample size was too small	Valid explanation	B1
	Total		**3 marks**
29.5 (a)	If they drove 0 miles, then they would spend £95 on train tickets.	Specifying cost if 0 miles driven	B1

Question	Answer	Extra information	Marks
29.5 (b)	$95 - 0.17(430)$ £21.90	Substituting into equation of regression line Correct answer. Must include units.	M1 A1
29.5 (c)	The regression line is for t on d. Would need equation of d on t to estimate the miles driven.	Explanation that line can only be used to estimate t not d	B1
29.5 (d)	If they drive a large number of miles (> 558) then the model would predict a negative amount of money spent on train tickets.	Need to explain that t will be negative	B1
	Total		**5 marks**
29.6 (a)	Since the coded data have a strong correlation	Must specify the coded data	B1
29.6 (b)	$\log t = \log k + b \log n \qquad 10^y = 10^{0.52} \times (10^x)^{2.2}$ $k = 10^{0.52}$ $k = 3.31 \quad$ and $\quad b = 2.2$	Use of laws of logarithm Use of exponential rules to simplify Correct answer	M1 M1 A1
	Total		**4 marks**
29.7 (a)	$y = 1.48 + 0.2x \qquad$ or $\qquad b = ka^t => \log b = \log ka^t$ $10^y = 10^{1.48 + 0.2x} \qquad$ or $\qquad \log b = \log k + \log a^t$ $10^y = 10^{1.48} \times 10^{0.2x} \qquad$ or $\qquad \log b = \log k + t \log a$ $10^y = 10^{1.48} \times (10^{0.2})^x \qquad$ or $\qquad k = 10^{1.48}$ and $a = 10^{0.2}$ $b = 30 \times 1.58^t$	Rewriting equation using powers of 10 or logarithms Using laws of logarithm or exponential rules to simplify Correct method for finding constants Final equation correct	M1 M1 M1 A1
29.7 (b)	There are initially 30 bacteria in the petri dish. The number of bacteria increases by 58% every hour.	Correct interpretation of their '30' Correct interpretation of their '1.58'. Do not allow 'increase per hour'. Must convey idea of proportionality.	B1 B1
	Total		**6 marks**

Question	Answer	Extra information	Marks
29.8 (a)	Opportunity (sampling)	Also allow 'convenience (sampling)'	B1
29.8 (b)	Mean = $\dfrac{340}{50}$ = £6.80	Correct answer	B1
	Standard deviation = $\sqrt{\dfrac{56210}{50} - 6.8^2}$	Method for standard deviation	M1
	= £32.83	Correct answer	A1
	Total		**4 marks**
29.9 (a)	Data was not available for these dates.	Require 'not available' or 'not recorded'	B1
29.9 (b)	Width = 3 × 0.5 = 1.5 cm	Correct width	B1
	Area = 6 ÷ 5 = 1.2	Using fact that area is proportional to frequency	M1
	Height = 1.2 ÷ 1.5	Method for finding height	M1
	= 0.8 cm	Correct height	A1
	Total		**5 marks**