

Question 4 (Total 9 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$\frac{59+31}{195} = \frac{90}{195} = 0.462$	B1	This mark is given for a correct value for the probability for the cloud cover
(b)(i)	$P(X \geq 7) = 1 - P(X \leq 6)$	M1	This mark is given for using $1 - P(X \leq 5)$ with B(8, 0.78)
	$= 1 - 0.5538$ $= 0.446$	A1	This mark is given for finding as correct value for the probability
(b)(ii)	$195 \times P(X = 7)$ $= 195 \times 0.3092$	M1	This mark is given for using $195 \times P(X = 7)$ with B(8, 0.78)
	$= 60.3$	A1	This mark is given for finding a correct value for the expected number of days
(c)	The answer to part (b)(i) of 0.446 is similar to 0.462 in part (a) The answer to part (b)(ii) of 60.3 is very close to 59 found in the data set	B1	This mark is given for a correct evaluation of the outcomes from part (b) to determine the appropriateness of Chen's model
(d)	$\frac{9+11}{31} = \frac{20}{31} = 0.645$	B1	This mark is given for a correct value for the probability for the cloud cover
(e)	The answer to part (d) of 0.645 is greater than that in part (a) of 0.462 This shows that there is a higher chance of having high cloud cover if the previous day had high cloud cover	B1	This mark is given for a correct comparison for the answer to part (d) with the data set
	Thus independence does not hold so a binomial model might not be suitable	B1	This mark is given for a correct conclusion stated