

Question	Scheme	Marks	AOs
1(a)	Area = $8 \times 1.5 = 12 \text{ cm}^2$ Frequency = 8 so $1 \text{ cm}^2 = \frac{2}{3} \text{ hour (o.e.)}$	M1	3.1a
	Frequency of 12 corresponds to area of 18 so height = $18 \div 2.5 = 7.2 \text{ (cm)}$	A1	1.1b
	Width = $5 \times 0.5 = 2.5 \text{ (cm)}$	B1cao	1.1b
		(3)	
(b)	$[\bar{y} =] \frac{205.5}{31} = \text{awrt } 6.63$	B1cao	1.1b
	$[\sigma_y =] \sqrt{\frac{1785.25}{31} - \bar{y}^2} = \sqrt{13.644641} = \text{awrt } 3.69$	M1	1.1a
	allow $[s =] \sqrt{\frac{1785.25 - 31\bar{y}^2}{30}} = \text{awrt } 3.75$	A1	1.1b
		(3)	
(c)	Mean of Heathrow is higher than Hurn and standard deviation smaller suggesting Heathrow is more reliable	M1	2.4
	Hurn is South of Heathrow so does <u>not</u> support his belief	A1	2.2b
		(2)	
(d)	$\bar{x} + \sigma \approx 10.3$ so number of days is e.g. $\frac{(11 - "10.3")}{3} \times 8 \text{ (+5)}$	M1	1.1b
	= 6.86 so 7 days	A1	1.1b
		(2)	
(e)	$[H = \text{no. of hours}] \quad P(H > 10.3) \text{ or } P(Z > 1) = [0.15865\dots]$	M1	3.4
	Predict $31 \times 0.15865\dots = \underline{\underline{4.9 \text{ or } 5 \text{ days}}}$	A1	1.1b
		(2)	
(f)	(5 or) 4.9 days < (7 or) 6.9 days so model may not be suitable	B1	3.5a
		(1)	
(13 marks)			

Question 1 continued**Notes:****(a)**

M1: for clear attempt to relate the area to frequency. Can also award if
their height $\times$ their width = 18

A1: for height = 7.2 (cm)

(b)

M1: for a correct expression for σ or s , can ft their value for mean

A1: awrt 3.69 (allow $s = 3.75$)

(c)

M1: for a suitable comparison of standard deviations to comment on reliability.

A1: for stating Hurn is south of Heathrow and a correct conclusion

(d)

M1: for a correct expression – ft their $\bar{x} + \sigma \approx 10.3$

A1: for 7 days but accept 6 (rounding down) following a correct expression

(e)

M1: for a correct probability attempted

A1: for a correct prediction

(f)

B1: for a suitable comparison and a compatible conclusion