Question Number	Scheme	Marks
1. (a)	[Area = k × frequency $\rightarrow$ 16.5 = k × 12 $\rightarrow$] Area = $\frac{16.5}{12}\times 18$ oe = **<u>24.75</u>** (cm^2)	M1 A1 (2)
(b)	fd method $\frac{24}{58-55}[=8]$ **and** $\frac{35}{55-50}[=7]$ **or** Area method $\frac{16.5}{12}\times 24[=33]$ **and** $\frac{16.5}{12}\times 35[=48.125]$ **or** $\frac{16.5}{12}\times\frac{24}{3}[=11]$ **and** $\frac{16.5}{12}\times\frac{35}{5}[=9.625]$ Let h = height of the 2nd tallest bar $[h=]\frac{10}{'8'}\times'7'$ **or** $[h=]\frac{"48.125"\times 10\times 3}{5\times"33"}$ **or** $[h=]"9.625"\times\frac{10}{"11"}$ = **<u>8.75</u>** (cm)	M1 dM1 A1 (3)
(c)(i)	$[Q_2=]50+\frac{7}{35}\times 5$ or $[Q_2=]55-\frac{28}{35}\times 5$ = **<u>51</u>** (cm)	M1 A1
(ii)	$[Q_3=]55+\frac{2}{24}\times 3$ or $[Q_3=]58-\frac{22}{24}\times 3$ **and** $"55.25"-45$ = **<u>10.25</u>** (cm)	M1 A1 (4)
(d)	$\frac{"55.25"-2("51")+45}{"55.25"-45}$ [= –0.17073… < 0] negative [skew].	M1 A1ft (2)
	Notes	**[11]**

(a)
M1 allow equivalent eg $16.5\times\frac{3}{2}$
A1 for 24.75 allow 24.8

(b)
M1 correct method for finding the frequency density or area for the highest **and** 2nd highest bars
Allow if 8 and 7 seen or 33 and 48.125 seen or 9.625 rather than 48.125 and/or 11 seen rather than 33
dM1 dep on previous M mark awarded. A fully correct expression for h or a fully correct equation to enable h to be found eg $\frac{"33"}{10\times 3}=\frac{"48.125"}{5h}$
A1 8.75 oe **NB** answer of 8.75 seen as final answer 3/3

(c)(i)
M1 for $50+\frac{7}{35}\times k$ **or** $55-\frac{28}{35}\times k$ **or** $\frac{Q_2-50}{k}=\frac{60-53}{88-53}$ **or** $\frac{55-Q_2}{k}=\frac{88-60}{88-53}$ where 4,, k,, 6 oe
(condone use of n + 1 ie 7.5 rather than 7, 27.5 rather than 28 or 60.5 rather than 60)
A1 51 (condone for use of n + 1 awrt 51.1)

(ii)
M1 $55+\frac{2}{24}\times t$ **or** $58-\frac{22}{24}\times t$ **or** $\frac{Q_3-55}{t}=\frac{90-88}{112-88}$ **or** $\frac{58-Q_3}{t}=\frac{112-90}{112-88}$ oe where 2,, t,, 4
and using $"\text{their } Q_3"-45$
(condone use of n + 1 ie 2.5 or 2.75 rather than 2, 21.5 or 21.25 rather than 22 or 90.5 or 90.75 rather than 90)
A1 10.25 oe eg 41/4 allow 10.3 from correct working

(d)	M1 substitution of their values from (c) seen **or** awrt –0.17 or –7/41 A1ft dependent on M1 being scored. Correct description of skewness consistent with their values from part (c) ignore the final answer if working shown. Only allow no skew or symmetrical if their value should be 0 Ignore correlation.