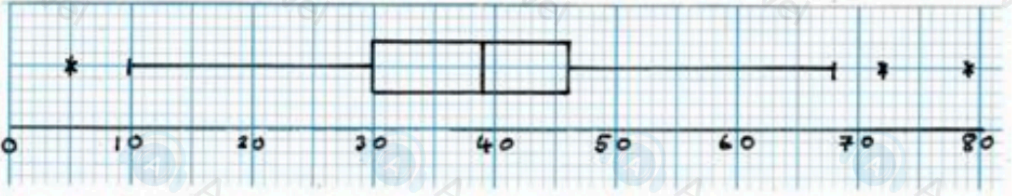


Question	Scheme	Marks
5. (a)	$[S_{ss}] = 44.22 - \frac{15^2}{9}; = 19.22$ or awrt 19.2	M1; A1 (2)
(b)	r is close to 1 so supports use of a linear model	B1 (1)
(c)	("hours of sunshine" would be explanatory) since t <u>depends on</u> s	B1 (1)
(d)	$(r =) 0.832 = \frac{S_{st}}{\sqrt{S_{ss} \times S_{tt}}}$ or $0.832 = \frac{S_{st}}{\sqrt{19.22 \times 10.89}}$ $S_{st} = 0.832 \times \sqrt{19.22 \times 10.89}$ So $S_{st} = 12.03688...$ awrt 12.0	M1 dM1 A1 (3)
(e)	$b = \frac{12.036...}{19.22}, = 0.62626...$ [awrt 0.62 or 0.63] $a = \bar{t} - 0.6262... \times \bar{s} = 14.1 - 0.6262... \times 1.6$ $t = 13.1 + 0.626s$	M1, A1ft M1 A1 (4)
(f)	$\sigma_s = \left(\sqrt{\frac{S_{ss}}{9}} \text{ or } \sqrt{\frac{44.22}{9} - \left(\frac{15}{9}\right)^2} \right) = 1.461...$ awrt 1.46	B1 (1)
(g)	$[13.1 + 0.626 \times 5] = 16.2...$ awrt 16.2	B1 (1)
(h)	$\bar{s} = 1.666...$ and $\sigma_s = 1.46...$ so $1.666... + 2 \times 1.46... (= 4.586)$ $s = 5$ is > 2 sd above the mean so it is outside the range therefore estimate is unreliable	M1 A1ft (2)
		(15 marks)

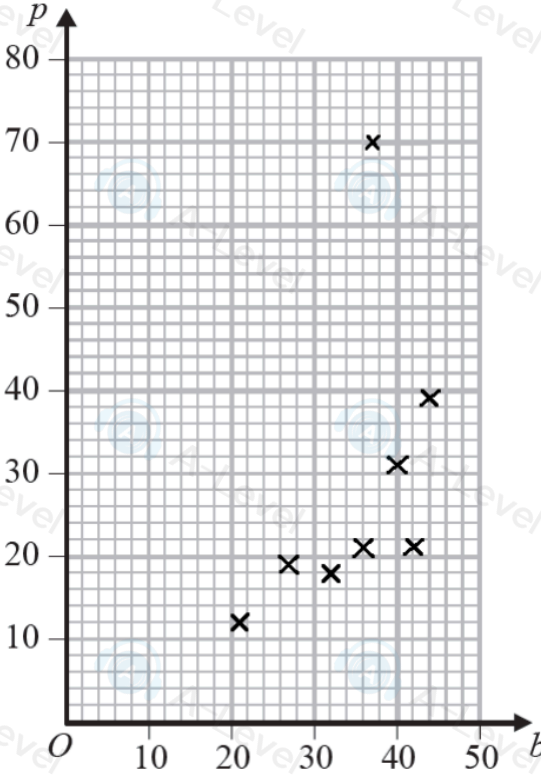
Question Number	Scheme	Marks
2.(a)	[pass for] <u>30</u> (labelled or 1 st answer)	B1 (1)
(b)	[merit for] <u>46</u> (labelled or 2 nd answer)	B1 (1)
(c)	$[1.5(Q_3 - Q_1) = 1.5 \times 16 = 24]$ so $c = \underline{70}$ and $d = \underline{6}$	B1, B1 (2)
(d)	<u>68, 72, 79</u>	B2/1/0 (2)
(e)	$5 < d$ therefore 5 is an outlier	M1 (2)
		A1 (3)
(f)	$\frac{1}{2} \times \left(\frac{1}{4}\right)^2 \times 3$ $= \underline{\underline{\frac{3}{32}}}$	M1M1 (3)
		A1 (3)
		[12 marks]

Question Number	Scheme	Marks
1.(a)	$S_{yy} = 2628.25 - \frac{141.5^2}{10} = 626.025^*$	M1A1cso (2)
(b)	$r = \frac{74.664}{\sqrt{9.25924 \times 626.025}}$ $= 0.98068...$ awrt <u>0.981</u>	M1 (2)
(c)	$r \approx 0.981$ is close to 1 or a strong correlation .	A1 (2)
(d)	$b = \frac{74.664}{9.25924} [= 8.063728...]$ $a = \frac{141.5}{10} - \left(\frac{74.664}{9.25924}\right) \times \left(\frac{49.04}{10}\right) = -25.39452...$ $y = -25.4 + 8.06x$	B1 (1)
(e)	$y = -25.4 + 8.06 \times 4.4 [= 10.08...]$ $m = (10.08...) + 25$ $= 35.085...(\text{mpg})$ awrt <u>35.1</u>	M1 (3)
(f)	As $44(p)/4.4(x)$ is within the range of the data set or it involves <u>interpolation</u> , (the actual miles per gallon should be) <u>reliable</u> .	M1 (3)
		A1 (3)
		(2)
	Notes	Total 13

Question Number	Scheme	Marks
1. (a)	25 small sq' = 5 tomatoes <u>or</u> 1 large square = 5 tomatoes <u>or</u> fd=5 for 2~3 <u>or</u> $\frac{5}{25} \times 20$ <u>or</u> 5×0.8 <u>or</u> 2×2 $= 4$	M1 A1 (2)
(b)	$100 - (5 + '4')$ <u>or</u> $16 + 32 + 25 + 10 + 8$, so probability = $\frac{91}{100}$ (condone 91%)	M1, A1 (2)
(c)	$\frac{(7 - 6.25) \times 16 + 25 + 10 + 8}{100}$ <u>or</u> $1 - \frac{(a) + 5 + 16 + (6.25 - 5) \times 16}{100} = \frac{55}{100}$	M1, A1 (2)
(d)	Since '0.55' > 0.5 (or equivalent reason) <u>and</u> state median > 6.25	B1 (1)
(e)	Median > mean, so negative skew	B1 (1)
(f)	Freq. for $(5.5 < \text{weight} < 7) = (7 - 5.5) \times '16'$ <u>or</u> $\frac{3}{4} \times '32'$, probability = $\frac{24}{100}$ P (both weigh between 5.5 and 7) = $\frac{24}{100} \times \frac{23}{99} = \frac{46}{825}$ (o.e.) <u>or</u> awrt 0.056	M1, A1 M1 A1 (4)
		[12 marks]

3. (a)	$29 \times 75 + 29 \times 83 + \dots + 46 \times 126 = 33\,856$	33856	B1cao (1)
(b)	$\sum m = 306$ and $\sum b = 861$ $S_{bm} = '33\,856' - \frac{'861' \times '306'}{8} = 922.75$	awrt 923	B1 M1 A1 (3)
(c)	$r = \frac{"922.75"}{\sqrt{3083.875 \times 305.5}} = 0.9506706\dots$	awrt 0.951	M1 A1 (2)
(d)	As milk price increase, so does bread price.		B1 (1)
(e)	Since bread price increases but milk price stays the same Therefore the correlation will decrease (or be weaker)		B1 dB1 (2)
			(9 marks)

Question Number	Scheme	Marks
2 (a) (i)	$S_{yy} = 81938.5 - \frac{2015^2}{50} [= 734] *$	B1*
(ii)	$r = \frac{219.55}{\sqrt{734 \times 72.25}} = 0.95338...$	awrt 0.953 M1 A1 (3)
(b)	e.g. [In general] the longer the rabbit the greater the weight	B1ft (1)
(c)	Consistent/Yes as r /PMCC is close to 1	B1ft (1)
(d)	$b = \frac{219.55}{734} = 0.2991...$	M1 A1
	$a = \left(\frac{125}{50}\right) - 'b' \left(\frac{2015}{50}\right) [= -9.554...]$	M1
	$w = -9.55 + 0.299y$	A1 (4)
(e)	$'-9.55' + '0.299' \times 45 = 3.905$	awrt 3.91 M1 A1ft (2)
	Notes	Total 11

Question	Scheme	Marks
<p>7.(a)</p>	 <p>(b) For any sensible comment about H being far away from the other points. e.g. ‘H is an outlier/anomaly’, ‘The blood protein/$p/70$ for H is much higher than the other patients’, ‘H does not follow the (linear) pattern’, ‘Data collected for H may be incorrect’, etc.</p> <p>(c) $r = \frac{369}{\sqrt{423 \frac{5}{7} \times 490}} = 0.809826106$</p> <p>(d) r would be closer to 0</p>	<p>B1B1 (-1ee)</p> <p>(2)</p> <p>B1</p> <p>(1)</p> <p>M1A1</p> <p>(2)</p> <p>B1</p> <p>(1)</p> <p>Total 6</p>