

1(a)	$r = 0.143$ to 0.1432	B3		AWFW
	or $r = 0.142$ to 0.144	B2		AWFW
	or $r = 0.1$ to 0.2	B1		AWRT
	Attempt at	Σx Σx^2 Σy Σy^2 Σxy		3952. 2228282 47.00. 292.0000 23517.50
	or Attempt at	S_{xx} S_{yy} S_{xy}	M1	275994. 15.875. 299.5
	Attempt at a correct formula for r	m1		
	$r = 0.143$ to 0.1432	A1	3	AWFW
(b)	Little/weak/no correlation/relationship/association between number of pages and (retail) price	B1		or equivalent: but not poor
		B1	2	context
(c)	Size (page, thickness), author, ranking, publicity marketing, cover design, recommendations on back, publisher, font, popularity, quality, print-run, etc	B1	1	or any sensible variable but not pictures, coloured pictures, age, words, weight, mass
(d)	(Very) strong/almost exact positive/perfect correlation/relationship/ association between number of pages and sale/new price Sale price appears to be determined by number of pages	B1		or equivalent
		B1	2	context
		B2		or equivalent
		Total		8

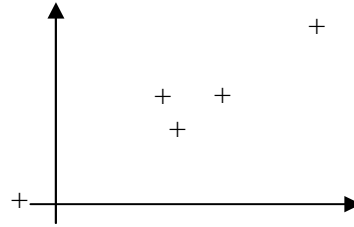
2(a)	$r = -0.526$ to -0.525	B3	AWFW
	or $r = -0.53$ to -0.52	(B2)	AWFW: ignore sign
	or $r = -0.6$ to -0.4	(B1)	AWFW: ignore sign
	OR Attempt at $\sum x$, $\sum x^2$, $\sum y$, $\sum y^2$ and $\sum xy$	(M1)	260, 6970, 143, 2083 and 3671
	or Attempt at S_{xx} , S_{yy} and S_{xy}	(m1)	210, 38.1 and -47
Attempt at a correct formula for r	(m1)		
	$r = -0.526$ to -0.525	(A1)	3 AWFW
(b)	Weak/some/moderate negative correlation (relationship/association)	B1	OE: must qualify strength and indicate negative B0 for strong/poor/reasonable/average B0 if $r > 0$ or $r < -1$ B0 if contradictory statements
	between		
	length and (maximum) diameter	B1	Context
	Ignore subsequent comments (as below) only if B1 B1 already scored		
	OR		
Some evidence that large lengths are associated with small diameters	(B1) (B1)	OE: must qualify strength and indicate negative	
OR			
Longer melons tend to have smaller diameters / be thinner	(B1) (B1)	OE: must qualify strength and indicate negative	
	Total	5	

Question Number	Scheme	Marks
3.	Diagram A : y & x : $r = - 0.79$; As x increases, y decreases or most points lie in the 2 nd and 4 th quadrant.	B1;B1dep
	Diagram B : v & u : $r = 0.08$; No real pattern. Several values of v for one value of u or points lie in all four quadrants, randomly scattered.	B1;B1dep
	Diagram C : t & s : $r = 0.68$; As s increases, t increases or most points lie in the 1 st and 3 rd quadrants	B1;B1dep (6)

Q	Scheme	Marks	AOs	Pearson Progression Step and Progress descriptor
4a	Continuous (quantitative) data	B1	1.2	1st Understand the difference between discrete and continuous data
		(1)		
4b	0.955	B1	1.1b	5th Calculate the PPMC as a measure of correlation
		(1)		
4c	$H_0: \rho = 0; H_1: \rho > 0$ Critical value = 0.7887 Reject H_0 , there is evidence that there is a positive correlation	B1 M1 A1	2.5 1.1a 2.2b	6th Carry out a hypothesis test for zero correlation
		(3)		
4d	Yes, evidence of a linear association between x and y	B1	2.4	4th Use the principles of bivariate data analysis in the context of the large data set
		(1)		
4e	10.4872 (accept 10.5 or better)	B1	1.1b	4th Make predictions using the regression line within the range of the data
		(1)		

Qu 5	Scheme	Marks	AO
(a)	$H_0: \rho = 0$ $H_1:$ Critical value: -0.6215 (Allow any cv in range $0.5 < cv < 0.75$) $r < -0.6215$ so significant result and there is evidence of a negative correlation between w and t	B1 M1 A1 (3)	2.5 1.1a 2.2b
(b)	e.g. As temperature increases people spend more time on the beach and less time shopping (o.e.)	B1 (1)	2.4
(c)	Since r is close to -1 , it is consistent with the suggestion	B1 (1)	2.4
(d)	t will be the explanatory variable since sales are likely to depend on the temperature	B1 (1)	2.4
(e)	Every degree rise in temperature leads to a drop in weekly earnings of £171	B1 (1)	3.4
		(7 marks)	

6. (a)



1st B1 for 5 or more points on a straight line of positive gradient

B1

1

(b)

M1M1

	A	B	C	D	E	F	G
Rank (Judge 1)	1	4	2	3	5	6	7
Rank (Judge 2)	1	2	4	3	5	7	6
d^2	0	4	4	0	0	1	1

$H_0 : \rho = 0$ $H_1 : \rho > 0$ (Allow ρ_s) ($H_1 : \rho \neq 0$ scores B0)

B1, B1

r_s 5% one tail critical value is **0.7143**

B1

Significant result or reject null hypothesis

M1

There is evidence of a (positive) correlation between the judges or the judges agree

A1ft

5

3rd B1 for the correct critical value – depends upon their

$H_1 : \rho > 0$ needs 0.7143, $\rho \neq 0$, 0.7857

The H_1 may be in words so B0B1 is possible. If no H_1 award for 0.7143 only.

5th M1 for a correct statement relating their r_s and their cv (may be implied by correct comment)

3rd A1ft follow through their r_s and their cv.

Comment in context. Must mention judges.

Don't insist on "positive" and condone it if they are using $\rho \neq$

0.