Question Number	Scheme	Marks
3.(a)	$[S_{vs} =] 177.311 - \frac{36.8 \times 29}{8} = 43.911$ = awrt **43.9**	A1
		M1
	$[S_{ss} =] 209.72 - \frac{36.8^2}{8} = 40.44$ = awrt **40.4**	A1
		(3)
(b)	$r = \frac{"43.911"}{\sqrt{55.275 \times "40.44"}}$, $= 0.92875\ldots$ = awrt **0.929**	M1, A1
		(2)
(c)	e.g. r is close to 1 so there is support for the publisher's belief/data can be described as a linear regression	B1ft
		(1)
(d)	$b = \frac{"43.911"}{55.275}$, $= 0.7944\ldots$ = **awrt 0.79**	M1, A1
	$a = \bar{s} - b\bar{v} = \frac{36.8}{8} - "0.7944..." \times \frac{29}{8} = 4.6 - "0.7944..." \times 3.625$ [= 1.720…]	M1
	s =1.72 + 0.794v	A1
		(4)
(e)	$\frac{y}{1000} = "1.72" + "0.794" \times \left(\frac{x+50}{200}\right)$	M1
	y = 1920 + 3.97x	A1ft A1
		(3)
(f)	Gradient of textbooks is greater	B1ft
	spend more advertising on textbooks	dB1ft
		(2)
		Total: 15

Notes

(a)

M1 for a correct expression for S_{vs} or S_{ss} may be implied by awrt 43.9 or awrt 40.4

A1 (for S_{vs} =) awrt 43.9

A1 (for S_{ss} =) awrt 40.4 or allow $\frac{1011}{25}$

Condone missing labels

(b)

M1 for a correct expression for r, ft their 43.911 (but not 177.311) and their 40.44 (not 209.72)

A1 for awrt 0.929 (note awrt 0.929 scores 2/2)

(c)

B1ft for saying it **does** support the belief oe **and** giving a suitable reason e.g. **strong** correlation or as r is close to 1 ft on their value for r.

If $|r|$<0.5 then allow e.g. "close to 0" so does not support oe

condone a reason that 0.929 is approximately 1

(d)	M1	for a correct expression for b, ft their 43.911 and allow 3sf values to be used. Implied by awrt 0.79
	A1	for awrt 0.79 or allow an exact fraction including the 3sf values e.g. $\frac{439}{553}$
	M1	for a correct method for a, ft their value of b scored for the values correctly substituted or implied by a correct equation
	A1	for **equation** for s in terms of v with a = awrt 1.72 and b = awrt 0.794
(e)	M1	for correct substitution into their equation. Must be in y and x. May attempt to find summary statistics in terms of x and y before finding the regression line y on x – in such cases it needs to be a fully correct method, allowing 1 slip but correct value for d
	A1ft	for d = awrt 3.97 (accept awrt 4.0) or $5 \times$ (their b) (correct to 2 sig. figs.) provided M1 is scored
	A1	for c = awrt 1920 (to 3sf) provided M1 is scored
(f)	B1ft	for a suitable comparison based on gradients, following through on their gradients Condone comparison of '3.97x' and '1.2x'. Must be a comparison not just stating a fact. Does not need to be in context. Ignore other statements provided they do not contradict the comparison Do not allow substituting in values unless it is used to compare gradients i.e. they would need to substitute in at two different values for x (or v) for both lines.
	dB1ft	dependent on the previous B mark. It is for recommending spend more on advertising textbooks (allow "yes" to mean spending more on advertising textbooks). **Must be consistent with their correct comparison from their equations.** **If gradient in (e) < 1.2 then a comparison of gradients leading to spending on novels.**