Question Number		Scheme	Marks
6.	(a)	$\left[\sum y = 16 \times 20.5 = 328\right]$ $S_{yy} = 8266 - \frac{328^2}{16}$	M1
		$= 1542$ (allow awrt 1540)	A1
		$[r =] \frac{-630.9}{\sqrt{368.16 \times "1542"}}$	M1
		$= -0.837336\ldots$ awrt **-0.837**	A1
			(4)
	(b)	As the distance from the hospital increases the percentage of referrals decreases (o.e.) e.g. smaller % of patients attend from clinics further away	B1
			(1)
	(c)	e.g. Points close to a straight line (of negative gradient) so does support belief	B1
			(1)
	(d)	$b = \frac{-630.9}{368.16}$ $[= -1.7136\ldots]$	M1
		$a = 20.5 - "-1.7136..." \times 8.1$ $[= 34.3806\ldots]$	M1
		$y = 34.38\ldots - 1.7136\ldots x$ **$y = 34.4 - 1.71x$**	A1, A1
			(4)
	(e)	[On average] each km further from the hospital reduces the % attendance by 1.7%	B1
			(1)
	(f)	Correct line drawn on scatter diagram (use overlay within guidelines)	B1
			(1)
	(g)	Correct point circled (3.2,19) [Allow coords stated instead of point circled but if both, prioritise circled point]	B1 (1)
			[13]

	Notes
(a)	1st M1 for an attempt at a correct expression for S_{yy} (ft their 328 provided intention is Σy) 1st A1 for 1542 (allow awrt 1540 it leads to $r = -0.83788\ldots$ and scores 2nd A0) 2nd M1 for a correct expression for r (ft their S_{yy} but use of 8266 is M0 here) 2nd A1 for awrt -0.837 (ans only 4/4; awrt -0.838 M1A1M1A0; -0.84 M1A0M1A0)
(b)	B1 for an interpretation of negative correlation <u>in context</u> (just "strong neg correlation" B0)
(c)	B1 for " points close to a straight line" <u>and</u> stating does support manager's belief <u>or</u> allow "r is close to -1" <u>or</u> "strong (negative) correlation" <u>and</u> supports manager's claim <u>or</u> for a curve drawn on scatter diagram <u>and</u> comment that non-linear model may be better
(d)	1st M1 for a correct expression for b 2nd M1 for a correct expression for a (ft their value of b or even letter b in correct formula) 1st A1 (dep on 1st M1) for b = awrt -1.71 in an equation in y and x (no fractions) 2nd A1 (dep on 2nd M1) for a = awrt 34.4 in an equation in y and x
(e)	B1 for a comment with their b (<0) relating distance from hospital to % attendance/referrals Allow "as distance increases by 1 the % referrals decreases by 1.7" (o.e.)
(f)	B1 for drawing the line on scatter diagram (within guidelines of overlay-check both graphs)
(g)	B1 for correct point on scatter diagram circled (more than one point circled is B0)

Pearson Education Limited. Registered company number 872828
with its registered office at 80 Strand, London, WC2R 0RL, United Kingdom