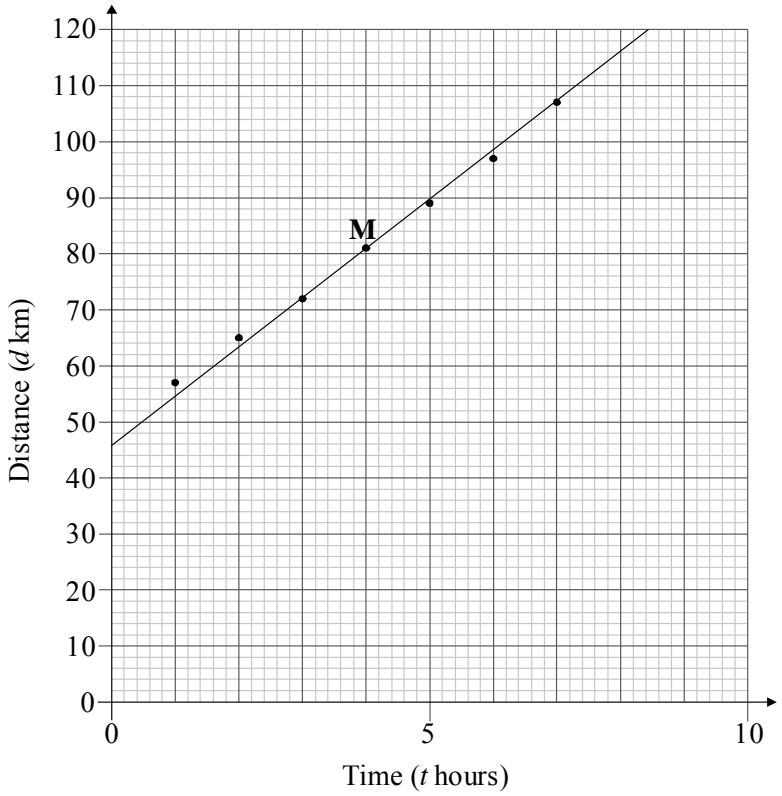
1) (a)



(A1)(A2) ***[3 marks]***

Notes: Award ***(A1)*** for axes labelled with d and t and correct scale, ***(A2)*** for 6 or 7 points correctly plotted, ***(A1)*** for 4 or 5 points, ***(A0)*** for 3 or less points correctly plotted. Award at most ***(A1)(A1)*** if points are joined up.
If axes are reversed award at most ***(A0)(A2)***

(b) (i) $\bar{t} = 4$ ***(G1)***

(ii) $\bar{d} = 81.1\left(\frac{568}{7}\right)$ ***(G1)*** ***[2 marks]***

Note: If answers are the wrong way around award in (i) ***(G0)*** and in (ii) ***(G1)*****(ft)**.

(c) Point marked and labelled with M or $\bar{t}, \bar{d}$ on their graph ***(A1)*****(ft)*****(A1)*****(ft)*** ***[2 marks]***

(d) Line of best fit drawn that passes through their M and $(0, 48)$ ***(A1)*****(ft)*****(A1)*****(ft)*** ***[2 marks]***

Notes: Award ***(A1)*****(ft)** for straight line that passes through their M, ***(A1)*** for line (extrapolated if necessary) that passes through $(0, 48)$.
Accept error of ± 3. If ruler not used award a maximum of ***(A1)*****(ft)*****(A0)***.

(e) 4.5h (their answer ± 0.2) ***(M1)(A1)*****(ft)*****(G2)*** ***[2 marks]***

Note: Follow through from their graph. If method shown by some indication on graph of point but answer is incorrect, award ***(M1)(A0)***.

continued…

(f) $d = 8.25t + 48.1$ ***(G1)(G1)*** ***[2 marks]***

Notes: Award ***(G1)*** for 8.25, ***(G1)*** for 48.1.
Award at most ***(G1)(G0)*** if $d = (or\ \ y =)$ is not seen.
Accept $d - 81.1 = 8.25(t - 4)$ or equivalent.

(g) (i) $d = 8.25 \times 10.3 + 48.1$ ***(M1)***
$d = 133$ km ***(A1)*(ft)*(G2)***

(ii) No ***(A1)***
Outside the set of values of t or equivalent. ***(R1)*** ***[4 marks]***

Note: Do not award ***(A1)(R0)***.

Total [17 marks]

2) (a) (i) 50 ***(G1)***

(ii) 16.8 ***(G1)***

(iii) 30.5 ***(G1)***

(iv) 12.3 ***(G1)***

Note: Award ***(A1)(ft)*** for 13.0 in (iv) but only if 17.7 seen in (a)(ii). ***[4 marks]***

(b) $r = \dfrac{188.5}{(16.79 \times 12.33)}$ ***(M1)***

Note: Award ***(M1)*** for using their values in the correct formula.

$= 0.911$ (accept 0.912, 0.910) ***(A1)*(ft)*(G2)*** ***[2 marks]***

(c) $y = 0.669x - 2.95$ ***(G1)(G1)***

Note: Award ***(G1)*** for $0.669x$, ***(G1)*** for −2.95. If the answer is not in the form of an equation, award at most ***(G1)(G0)***. ***[2 marks]***

(d) Depth $= 0.669 \times 55 - 2.95$ ***(M1)***
$= 33.8$ ***(A1)*(ft)*(G2)*(ft)***

Note: Follow through from their (c) even if no working seen. ***[2 marks]***

(e) (i) 64.0 (accept 63.95, 63.9) ***(A1)*(ft)*(G1)*(ft)***

Note: Follow through from their (c) even if no working seen.

(ii) It is not valid. It lies too far outside the values that are given. *Or equivalent*. ***(A1)(R1)***

Note: Do not award ***(A1)(R0)***. ***[3 marks]***

3) (a) $r = \dfrac{S_{xy}}{S_x S_y}$

$= \dfrac{4.16}{(8.96)(0.610)}$ ***(M1)***

$= 0.76$ ***(A1)***

(b) There is a fairly strong positive correlation between high school grades and university grades. ***(A1)(A1)***

Note: Award ***(A1)*** for strong (or fairly strong) or high, ***(A1)*** for positive.

(c) $y - \overline{y} = \dfrac{S_{xy}}{S_x^{\,2}}(x - \overline{x})$

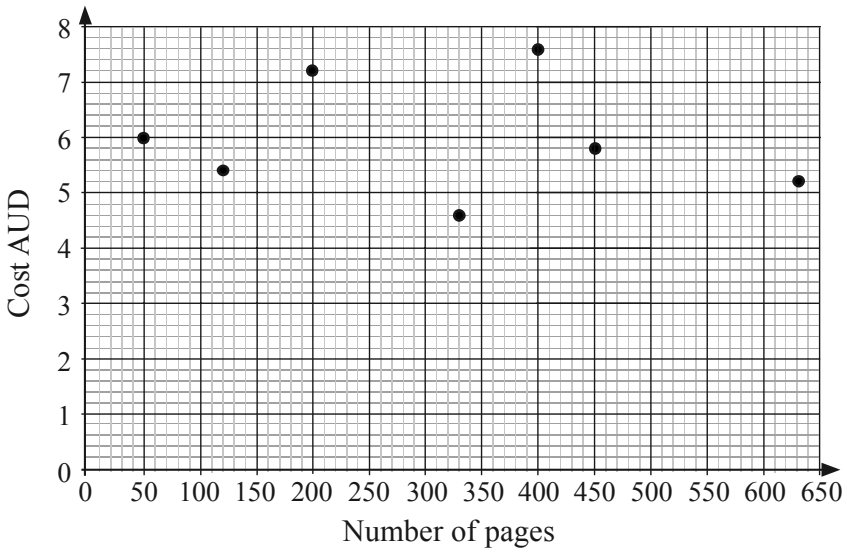
$y - 3.04 = \dfrac{4.16}{8.96^2}(x - 83.5)$ ***(M1)***

$y = 0.052x - 1.29$ (3 s.f.) ***(A1)***

Note: Award ***(C2)*** for correct answer (from calculator).

[6 marks]

4) (ii) (a)



(A1)(A1)(A1)

(A1) *for label and scales,* ***(A2)*** *for all points correct,* ***(A1)*** *for 5 or 6 correct.*
Award a maximum of ***(A2)*** *if points are joined.* ***[3 marks]***

(b) $r = -0.141$ ***(G2)***
If negative sign is missing award ***(G1)(G0)****.* ***[2 marks]***

(c) 'The coefficient of correlation is too low, (very) weak (linear) relationship'. ***(R1)***
Not a sensible thing to do, *accept 'no'*. ***(A1)***
Do not award ***(R0)(A1)***
Note: The correlation coefficient has to be mentioned in their reasoning. ***[2 marks]***

5)	(ii)	(a)	(i)	19.2	***(G1)***	
			(ii)	1.45	***(G1)***	***[2 marks]***
		(b)		$r = 0.942$	***(G1)***	***[1 mark]***
		(c)		Strong, positive correlation.	***(A1)*(ft)(A1)*(ft)**	***[2 marks]***
		(d)	(i)	$d = 11.5$	***(G1)***	
			(ii)	$n = 11.5 \times 19.6 - 100$ $= 125$ (*accept* 126) *Answer must be a whole number*	***(A1)*(ft)**	***[2 marks]***
		(e)		It is unreliable to extrapolate outside the values given (outlier).	***(R1)***	***[1 mark]***