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Qn		Working	Answer	Mark	Notes	
1		20 x 8 = 160 or 23 x 9 = 207 207 – 160	47	2	M1 A1	for 160 or 207 cao
2		$x + 20$ $2(x) + 2(x+20) = 4x + 40$ $4x + 40 < 300$ $4x < 260$ $x < 65$	64m	4	B1 M1 A1 B1	for finding length as an expression for solving equation $x < 65$ cao
3	(a) (b) (c)		Plotted accurately Positive 5.42pm – 5.46pm	1 1 3	B1 B1 B1 M1 A1	cao cao for line of best fit drawn between 30 min – 34 min 5.42pm – 5.46pm
4			A & 3 B & 4 C & 2 D & 1	2	B2 B1	for all correct for two correct
5		3.5 x 2 = 7 7 – 1 = 6 2 x 2 = 4 4 – 8 = -4	(6,-4)	2	M1 A1	for complete method cao
6		$10^2 - 5^2 = 75$ $\sqrt{75} = 5\sqrt{3}$ or 8.660254038 5 x 6 = 30cm^2 $(5 \times 5\sqrt{3}) \div 2 = 21.65063509$ $30 + 21.6506…. = 51.6506…$	51.7cm^2	4	P1 M1 M1 A1	starts process eg. Pythagoras theorem for finding area $(5 \times 5\sqrt{3}) \div 2$ for starting process eg. finding perimeter cao

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7		$25000 \div \$1.25 = £20000$ $20000 + 900 = £20900$ $20900 \times 1.15 =$	£24035	4	P1 M1 M1 A1	starts process eg. changing currency for complete method for 15% of 20000 cao
8	(a)	$1 - 0.7 = 0.3$	0.7,0.3 0.65,0.35,0.65, 0.35	2	B2 B1	for all correct entries on probability tree for at least 4 correct entries on probability tree
	(b)	0.7×0.65	0.455	2	M1 A1	for 0.7 x 0.65 cao
9		$50 \times \sin(60) = 43.30127019$ $50 \times \cos(60) = 25$ Perimeter $= 50 + 20 + 43.30.. + 20 +$ $25 = 158.3012702$ $158.30… \times 11.45 (= 1812.549544)$	£1812.55	5	P1 M1 M1 M1 A1	for starting process eg. using correct trigonometry ratio for using correct trigonometry ratio or Pythagoras theorem for finding perimeter eg. add all their lengths for 158.30… x 11.45 cao
10		Gradient of L = -2 Perpendicular Gradient $= \frac{1}{2}$ $y = \frac{1}{2}x + c$ Substitute in (1,1)	$y = \frac{1}{2}x + \frac{1}{2}$	4	M1 M1 M1 A1	for finding gradient of L for finding perpendicular gradient for correct substitution cao
11		$2t + 3c = 2000$ $3t + 2c = 2500$	Table £700 Chair £200	5	M1 A1	for attempt to use variables to represent table & chair for both equations correct

Qn	Working	Answer	Mark	Notes	
	$4t + 6c = 4000$ $9t + 6c = 7500$ $5t = 3500$ $t = 700$ $2(700) + 3c = 2000$ $3c = 600$ $c = 200$			M1 M1 A1	for correct method to eliminate for substituting calculated value into either equation cao
12	$M \alpha r^3$ or $M = k r^3$ $200 = k (10^3)$ $k = \dfrac{1}{5}$ $M = \dfrac{1}{5} r^3$ $M = \dfrac{1}{5} (15^3)$	675g	4	M1 B1 M1 A1	for correct expression or equation correct value of k for attempting to substitute "their k" value cao
13	$\pi 5.6^2$ x h $31.36\pi h = 1250$ $h = 1250 \div 31.36\pi$	12.7cm	3	P1 M1 A1	starts process to substitute r = 5.6 into the formula for rearranging to make 'h' the subject cao
14	$2x - 1$ or $x - 2$ $2x (3x + 7) + (2x - 1)(2x + 9)$ $6x^2 + 14x +$(or)$ 4x^2 + 18x - 2x - 9$ $10x^2 + 30x - 9$ $(10x^2 + 30x - 9)(x + 1)$	$10x^3 + 40x^2 +$ $21x - 9$	4	M1 M1 M1 A1	for finding either missing length for a correct expression for one area of the cross section for complete method to find the volume cao
15	$p(n + a) = n^2 + a$ $pn + pa = n^2 + a$ $pa - a = n^2 - pn$ $a(p - 1) = n^2 - pn$	$a = \dfrac{n^2 - pn}{p - 1}$	4	M1 M1 M1 A1	for multiplying both sides by n+a for expanding brackets for factorising cao

Qn	Working	Answer	Mark	Notes
16	$\frac{1}{4}(2n^2 + 9n + 4)$ or $\frac{1}{4}(2n^2 + n)$ $\frac{1}{2}n^2 + \frac{9}{4}n + 1 - (\frac{1}{2}n^2 + \frac{1}{4}n)$ $\frac{1}{2}n^2 + \frac{9}{4}n + 1 - \frac{1}{2}n^2 - \frac{1}{4}n$	proof shown	4	M1 for either correct expansion M1 for complete expansion M1 for complete expansion and simplified C1 for complete and correct proof
17	Area A $= \sqrt{3}x$ Area B $= 2\sqrt{3} \times \sqrt{6} = 6\sqrt{2}$ $\sqrt{3}x = 6\sqrt{2}$ $x = \frac{6\sqrt{2}}{\sqrt{3}}$ $x = \frac{6\sqrt{6}}{3}$	$x = 2\sqrt{6}$	4	M1 for working out both correct areas M1 for equating the areas M1 for multiplying top & bottom $\sqrt{3}$ A1 cao
18 (a)		7.65	1	B1 cao
(b)	d = 34.15 $t = \sqrt{\frac{2(34.15)}{7.65}}$	2.987…	3	B1 cao M1 for correct substitution A1 cao
19	$8 = ab^0$ $b^0 = 1$ $a = 8$ $16 = ab^1$ $16 = 8b$ $b = 2$ $q = ab^{1.7}$ $q = (8)(2)^{1.7}$	$q = 25.99$ or 26	6	M1 substituting x = 0 and y = 8 A1 for a = 8 M1 for substituting x = 1 and y = 16 A1 for b = 2 M1 for substituting "their a and b" value A1 cao

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Qn		Working	Answer	Mark		Notes
20	(a)	Area A = $\frac{2 \times 5}{2} = 5$ Area B = $\frac{(5+7) \times 2}{2} = 12$ Area C = $\frac{(7+8) \times 2}{2} = 15$ Area D = $\frac{(8+8.5) \times 2}{2} = 16.5$ Area E = $\frac{(8.5+9) \times 2}{2} = 17.5$ $5 + 12 + 15 + 16.5 + 17.5 =$	66	4	C1 M1 M1 A1	for splitting the area into 5 strips for finding area of one shape for complete process to find the area under the curve cao
	(b)	Underestimate Curve bends outwards		2	B1 C1	cao for correct explanation

TOTAL FOR PAPER IS 80 MARKS