

PAPER 3H

No	Working	Answer	Mk	Notes
1a	6.2 ± 0.1 or a length x 5	194 ± 2 ⁰	2	B2 (± 5 ⁰ : B1)
b		31 ± 0.5 km	2	M1 A1
c		Correct pos'n ± 1mm	2	B2 (either 135 or 90 ± 2 ⁰ : B1)
2a	100 or / seen	17, 26	2	B1B1
b		10	2	M1 A1
3a	2/3 x 5 or 10/3	3 ^{1/3} 12	2	M1 A1
bi	9/12 and 10/12 or 19/12		1	B1 M1 or 18/24 and 20/24, or 38/24 etc
bii	or 45/12 and 34/12		2	A1 or 6 ¹⁴ / ₂₄
4	2775 – 2500 <u>275</u> x 100 2500	11%	3	M1 M1 A1
5a	60/260	3/13	2	M1
b	60 x 195/260 or her 3/13 x 195	45	2	A1f Follow her grad or %
6a		Correct line	1	B1 thro' ≥ 3 pts ± 2mm
b		x = 3 OR y = 4 drawn Correct region clear	4	B1 B3 B1 x+y ≥ 4 B1 x ≤ 3 OR y < 4 B1 if correct region clear. ft his (a) and/or his x = 3 & y = 4 so long as vert & horiz pair
7a	$\sin 40^\circ = OT / 6$ $OT = 6 \sin 40^\circ$ $\cos 36^\circ = \text{his } 3.86 / OQ$ $OQ = (\text{his } 3.86) / \cos 36^\circ$	Tangent, radius	1	B1
b		3.86 cm	3	M1 M1 A1 or better
c		4.77 or 4.8 cm	3	M1 M1 A1f or better

No	Working	Answer	Mark	Notes	
8ai	Attempt find 12 th or 13 th student's age □/fx attempted (= 415) /24	16	1	B1	
aii		17.5	2	M1 A1	
aiii		17.3 or better	3	M1 A1	M1dep M0M0A0 17, no wkng, M1M1A1
bi,ii		18 > old mean Increase	2	B1 B1	17, correct wkng, M1M1A1
9a	v/h attempted	2	2	M1	
b		$y = 2x - 1$	2	A1 B2	2x: B1
c		$y = 2x + c, c \neq 1$	1	B1	-1: B1; omit "y=": -B1 incl $y = 2x$
10a	4.5x10 ⁹ / 1.5x10 ⁸ or inverted or 30 or 1/30 seen	Mars	1	B1	
b		1:30	2	M1 A1	
11ai	A∩B' shaded Eg 5, 10, 20 Shape, wholly within A & overlapping B Eg 15, 45, 75	1	1	B1	
aii		1	1	B1	No ft from diag
bi		1	1	B1	
bii		1	1	B1	
12ai	<s in same seg Opp <s of cyc quad 180 - (40 + 55)	55 ⁰	2	SC1: aii 30, 15, 45 & bii 30, 60, 90 B1	
aii		85 ⁰	2	B1	or equiv, eg both stand on DC
bi		No.	3	B1	
bii		DCB (or DAC) ≠ 90 ⁰	3	B1	B1 or BDC = 40, <s in same seg
c			1	B1	

No	Working	Answer	Mark	Notes
13a		4/9 or 5/9 seen Correct structure 4/9 or 5/9 correctly placed once All correct		B1 B1 With labels correct or omitted B1 B1
b	$4/9 \times 5/9 + 5/9 \times 4/9$	40/81 or 0.49.... oe	4	M2 (M1 for one product) A1f ft his tree if p's < 1
14a	0.006×3^3	0.162	2	M1 A1 M1
b	$\frac{3240}{6}$ or 20 000 seen her 0.162 0.2×3^2 or 1.8 seen her 20 000 x her 1.8 x 1.2	\$43 200	4	M1 M1 Dep both M1s scored A1
15	$\frac{-2 \pm \sqrt{4 - (-72)}}{6}$ oe			M1
16a		1.12, -1.79 or better $(2x-1)(x+3)$	3	A1, A1
b	$\frac{(x+3)(x-3)}{(x-6)(x-3)}$		2	B2 (Signs interchanged, B1) M1 (Num.) M1 (Denom.) A1
17ai		$\frac{x+3}{x-6}$	3	
aii	his $2x - 4 = 0$	$2x - 4$		B1 M1
b		$x = 2$ $(2, -3)$ Coeff of x^2 +ve or shape is "U" oe Min $x = 2$	4	A1f Follow her linear y' A1f Follow her x
c	$x = \text{constant}$		2	B1 or any correct method B1dep B1 M1 A1
18	$\frac{1}{3} \square r^2 h = 12 \square$ $r^2 = \frac{36}{h}$	$r = \frac{6}{\sqrt{h}}$ oe	3	M1 M1 $\frac{1}{3} \square r^2 h = 12$ M0 A1 $r^2 = \frac{36}{\square h}$ M1

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19	7^2 or 49 seen	$7/2$	2	M1 A1
20ai	$3/10 \times 2/9$	$1/15$ or $0.066(66..)$ oe	2	M1 A1
ii	1 – her $1/15$	$14/15$ oe	2	M1 A1f
b	$4/12 \times 3/11 \times 8/10$	$4/55$ or $0.072(72..)$ oe	2	M1 A1