

Paper 1MA1: 2H			Notes	
Question	Working	Answer		
1		96	P1	a strategy to start to solve the problem eg $18 \div (7 - 4)$ ($=6$)
			P1	for completing the process of solution eg “6” $\times (4 + 5 + 7)$
			A1	cao
2		20.9	M1	correct recall of appropriate formula eg $\sin x = \frac{5}{14}$
			A1	for 20.9(248...)
3	(a)	$4n+2$	M	start to deduce nth term from information given eg $4n+k$ where $k \neq 2$
			A1	cao
			M1	starts method that could lead to a deduction eg uses inverse operations
			C1	for a convincing argument eg 34 is 107 so NO; $(108-5) \div 3$ is not an integer
4		conclusion (supported)	P1	$30 \div 70$ ($=0.428$)
			P1	$60 \times "0.428..."$
			C1	for conclusion linked to 25.7 mins, 30.3 miles or 69.2 mph
				$26 \div 60$ ($=0.4333...$)
				$70 \times "0.4333..."$
				$30 \div 26$ ($=1.153...$)
				$60 \times "1.153..."$

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5 (a) (b)		$22 \leq f < 24$	B1	
		21.9	M1	$x \times f$ using midpoints
			M1	(dep on previous mark) " $x \times f$ " $\div 40$
			A1	accept 22 if working seen
6		9.54	P1	$10^2 - 5^2 (=75)$
			P1	"75" + $4^2 (=91)$
			P1	$\sqrt{(10^2 - 5^2 + 4^2)}$
			A1	9.53 – 9.54
7 (a) (b) (c)		(1, 4)	B1	
		-0.4, 2.4	B1	
		3.75	B1	accept 3.7 – 3.8
8		6 : 2 : 1	M1	for correct interpretation of any one statement eg. 3 : 1; 1 : 0.5
			A1	accept any equivalent ratio eg. 3 : 1 : 0.5

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9		203	P1	translate into algebra for rectangle: $4x+4x+3x+4+3x+4$ ($=14x+8$) or for trapezium: $5x+5x+x-3+7x-3$ ($=18x-6$)
			P1	equating: eg $18x-6=14x+8$ ($4x=14$)
			A1	solving for x: $x=14/4 = 3.5$ oe
			P1	process to find area: " 3.5 " $\times$ $3+4$ (ft) or " 3.5 " $\times$ 4 ft
			A1	cao
10 (a)		1.8%	P1	for start to process eg. 2000×1.025 ($=2050$)
			P1	for process to use all given information eg " 2050 " $\times$ $m^2 = 2124.46$ or " 2050 " $\times$ $\left(1 + \frac{x}{100}\right)^2 = 2124.46$
			P1	for process to find their unknown eg $m = \sqrt{\frac{2124.46}{2050}}$ ($= 1.01799...$)
			A1	for $1.79\% - 1.8\%$
(b)		200	M1	$225 \div 1.125$ oe
			A1	

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11		29°	C1	angle $OTP = 90^\circ$, quoted or shown on the diagram
			M1	method that leads to $180 - (90 + 32)$ or 58 shown at TOP OR that leads to 122 shown at SOT
			M1	complete method leading to " $58^\circ \div 2$ or $(180 - "122") \div 2$ or 29 shown at TSP
			C1	for angle of 29° clearly indicated and appropriate reasons linked to method eg angle between <u>radius</u> and <u>tangent</u> = 90° and sum of <u>angles</u> in a <u>triangle</u> = 180° ; <u>ext angle</u> of a <u>triangle</u> <u>equal</u> to sum of <u>int opp angles</u> and <u>base angles</u> of an <u>isos triangle</u> are <u>equal</u> or <u>angle</u> at <u>centre</u> = $2 \times$ <u>angle</u> at <u>circumference</u> or <u>ext angle</u> of a <u>triangle</u> <u>equal</u> to sum of <u>int opp angles</u>
12		0.4, 0.6	B1	correctly placing probs for light A eg 0.4, 0.6
(a)		0.3, 0.7, 0.8, 0.2	B1	correctly placing probs for light B eg 0.3, 0.7, 0.8, 0.2
(b)		B with correct probabilities	P1	(ft) eg 0.4×0.3 or 0.6×0.8 or $1 - (0.28 + 0.12)$
			P1	both sets of correct probability calculations
			C1	Correct interpretation of results with correct comparable results
13		20	M1	Establishing method linked to proportion eg $d = k \div c$ or $25 = k \div 280$
			M1	(dep) substitution eg $d = 7000 \div 350$ or $25 \times 280 \div 350$ oe
			A1	cao

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14	$ \begin{aligned} &(4n^2+2n+2n+1) \\ &\quad - (2n+1) = \\ &4n^2+4n+1-2n-1 \\ &= 4n^2 + 2n \\ &= 2n(2n + 1) \end{aligned} $	proof (supported)	<p>M1 for 3 out of 4 terms correct in the expansion of $(2n + 1)^2$ or $(2n + 1) \{(2n + 1) - 1\}$</p> <p>P1 for $4n^2 + 2n$ or equivalent expression in factorised form</p> <p>C1 for convincing statement using $2n(2n + 1)$ or $2(2n^2 + n)$ or $4n^2 + 2n$ to prove the result</p>
15		$\frac{23}{90}$	<p>M1 For a fully complete method as far as finding two correct decimals that, when subtracted, give a terminating decimal (or integer) and showing intention to subtract eg $x = 0.2\dot{5}$ so $10x = 2.5\dot{5}$ then $9x = 2.3$ leading to...</p> <p>A1 correct working to conclusion</p>
16		$\frac{2x+1}{3x+5}$	<p>M1 for $(3x \pm 5)(2x \pm 1)$ or $(2x + 1)(2x - 1)$</p> <p>M1 $\frac{1}{(3x \pm 5)(2x \pm 1)} \times (2x + 1)(2x - 1)$</p> <p>A1</p>
17		4.89	<p>M1 $\frac{40}{360} \times 2 \times \pi \times 7$ oe</p> <p>A1 4.8 – 4.9</p>

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18		0.229 With Explanation	<p>B1 Finding bound of s: 3.465 or 3.475 or 3.474999... or Finding bound of t: 8.1315 or 8.1325 or 8.132499...</p> <p>P1 Use of "upper bound" and "lower bound" in equation</p> <p>P1 Process of choosing correct bounds eg $\frac{\sqrt{3.475}}{8.1315}$ or $\frac{\sqrt{3.465}}{8.1325}$</p> <p>A1 For 0.2292... and 0.2288.. from correct working</p> <p>C1 For 0.229 from 0.2292.. and 0.2288.. since both LB and UB round to 0.229</p>
19		Sketch	P1 Parabola passes through all three of the points (0, 4), (2, 0), (4, 4)
(a)		Sketch	P1 Parabola passes through all three of the points (-4, -1), (-2, 2), (0, -1)
(b)			
20		$x=0, y=5$ $x=-4, y=-3$	<p>M1 Initial process of substitution eg $x^2 + (2x + 5)^2$ (=25)</p> <p>M1 for expanding and simplifying eg $x^2 + 4x^2 + 10x + 10x + 25$ (=25)</p> <p>M1 Use of factorisation or correct substitution into quadratic formula or completing the square to solve an equation of the form $ax^2 + bx + c = 0$, $a \neq 0$</p> <p>A1 correct values of x or y</p> <p>C1 $x = 0, x = -4, y = 5, y = -3$ correctly matched x and y values</p>

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21 (a)		130	P1	start to process eg draw a labelled triangle or use of sine rule $\frac{\sin Q}{8.7} = \frac{\sin 32}{5.2}$
(b)			P1	process to find of Q eg $Q = \sin^{-1} \left[\frac{\sin 32}{5.2} \times 8.7 \right]$
			P1	process to find area of triangle PRQ .
			A1	22.5 – 22.6
			C1	angle PRQ is obtuse so need to find area of two triangles.
22		1361	P1	process using similar triangles to find base of small cone eg. 4 cm used as diameter or 2 cm used as radius
			P1	process to find volume of one cone
			P1	complete process to find volume of frustum
			P1	complete process to find mass or 1360 – 1362
			A1	1361 or 1360 or 1400