

Paper 1MA1: 2H		Answer	Notes		
Question	Working				
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) (b)		4n+2	M	start to deduce nth term from information given eg $4n+k$ where $k \neq 2$	
		No (supported)	A1	cao	
4		conclusion (supported)	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	
			P1	$30 \div 70 (=0.428)$	$26 \div 60 (=0.4333\dots)$
			P1	$60 \times "0.428\dots"$	$70 \times "0.4333\dots"$
			C1	for conclusion linked to 25.7 mins, 30.3 miles or 69.2 mph	
					$60 \times "1.153\dots"$

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5 (a) (b)		$22 \leq f < 24$ 21.9	B1 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) -0.4, 2.4 3.75	B1 B1 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 $m = \sqrt{\frac{2124.46}{2050}}$ ($=1.01799\dots$) A1 for $1.79\% - 1.8\%$ M1 $225 \div 1.125$ oe
(b)		200	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”÷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 triangle <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 angle at centre = <u>2x angle at circumference</u> or <u>ext angle</u> of a triangle <u>equal</u> to sum of <u>int opp angles</u>	
12 (a)		0.4,0.6	B1 correctly placing probs for light A eg 0.4, 0.6	
		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 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) \\ & - (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 $x = 0.\dot{2}\dot{5}$ so $10x = 2.\dot{5}\dot{5}$ 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	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... P1 Use of “upper bound” and “lower bound” in equation P1 Process of choosing correct bounds eg $\frac{\sqrt{3.475}}{8.1315}$ or $\frac{\sqrt{3.465}}{8.1325}$ A1 For 0.2292... and 0.2288.. from correct working C1 For 0.229 from 0.2292.. and 0.2288.. since both LB and UB round to 0.229
19 (a) (b)		Sketch Sketch	P1 Parabola passes through all three of the points (0, 4), (2,0), (4, 4) P1 Parabola passes through all three of the points (-4, -1), (-2,2), (0, -1)
20		$x=0, y=5$ $x=-4, y=-3$	M1 Initial process of substitution eg $x^2 + (2x + 5)^2 = 25$ M1 for expanding and simplifying eg $x^2 + 4x^2 + 10x + 25 = 25$ M1 Use of factorisation or correct substitution into quadratic formula or completing the square to solve an equation of the form $ax^2 + bx + c = 0, a \neq 0$ A1 correct values of x or y C1 $x = 0, x = -4, y = 5, y = -3$ correctly matched x and y values

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