Paper 1MA1: 2H			
Question	**Working**	**Answer**	**Notes**
1		96	P1 a strategy to start to solve the problem eg 18 ÷ (7 − 4) (=6) P1 for completing the process of solution eg "6" × (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
(b)		No (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)÷3 is not an integer
4		conclusion (supported)	P1 30 ÷ 70 (=0.428) / 26 ÷ 60 (=0.4333…) / 30 ÷ 26 (=1.153…) P1 60 × "0.428…" / 70 ×"0.4333…" / 60× "1.153…" C1 for conclusion linked to 25.7 mins, 30.3 miles or 69.2 mph

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Question	**Working**	**Answer**	**Notes**
5 (a)		$22 \leq f < 24$	B1
(b)		21.9	M1 $x \times f$ using midpoints
			M1 (dep on previous mark) "$x \times f$" ÷ 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)		(1, 4)	B1
(b)		−0.4, 2.4	B1
(c)		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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Question	**Working**	**Answer**	**Notes**
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" × 3+4 (ft) or "3.5" × 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" × 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 ÷ 1.125 oe A1

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Question	**Working**	**Answer**	**Notes**
11		29°	C1 angle $OTP = 90^o$, 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") ÷ 2 or 29 shown at *TSP* C1 for angle of 29° clearly indicated and appropriate reasons linked to method eg angle between radius and tangent = 90^o and sum of angles in a triangle = 180^o; ext angle of a triangle equal to sum of int opp angles and base angles of an isos triangle are equal or angle at centre = 2x angle at circumference or ext angle of a triangle equal to sum of int opp angles
12 (a)		0.4,0.6 0.3,0.7,0.8,0.2	B1 correctly placing probs for light A eg 0.4, 0.6 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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Question	**Working**	**Answer**	**Notes**
14	$(4n^2+2n+2n+1)$ $-(2n+1)=$ $4n^2+4n+1-2n-1$ $= 4n^2 + 2n$ $= 2n(2n + 1)$	proof (supported)	M1 for 3 out of 4 terms correct in the expansion of $(2n + 1)^2$ **or** $(2n + 1)\{(2n+1)-1\}$ P1 for $4n^2 + 2n$ or equivalent expression in factorised form C1 for convincing statement using $2n(2n + 1)$ or $2(2n^2 + n)$ or $4n^2 + 2n$ to prove the result
15		$\frac{23}{90}$	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… A1 correct working to conclusion
16		$\frac{2x+1}{3x+5}$	M1 for $(3x \pm 5)(2x \pm 1)$ or $(2x + 1)(2x - 1)$ M1 $\frac{1}{(3x\pm5)(2x\pm1)}\times(2x+1)(2x-1)$ A1
17		4.89	M1 $\frac{40}{360}\times2\times\pi\times7$ oe A1 4.8 – 4.9

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Question	**Working**	**Answer**	**Notes**
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)		Sketch	P1 Parabola passes through all three of the points (0, 4), (2,0), (4, 4)
(b)		Sketch	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 $x^2 + 4x^2 + 10x + 10x + 25$ (=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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Question	**Working**	**Answer**	**Notes**
21 (a)		130	P1 start to process eg draw a labelled triangle or use of sine rule $\frac{\sin Q}{8.7} = \frac{\sin 32}{5.2}$ 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
(b)			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