

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

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5	(a)		$22 \leq f < 24$	B1	
	(b)		21.9	M1 M1 A1	$x \times f$ using midpoints (dep on previous mark) " $x \times f$ " $\div 40$ accept 22 if working seen
	6		9.54	P1	$10^2 - 5^2 (=75)$
				P1	"75" + $4^2 (=91)$
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				
9			203	<p>P1 translate into algebra for rectangle: <math>4x+4x+3x+4+3x+4</math> (<math>=14x+8</math>) or for trapezium: <math>5x+5x+x-3+7x-3</math> (<math>=18x-6</math>)</p> <p>P1 equating: eg <math>18x-6=14x+8</math> (<math>4x=14</math>)</p> <p>A1 solving for <math>x</math>: <math>x=14/4 = 3.5</math> oe</p> <p>P1 process to find area: "3.5" <math>\times</math> 3+4 (ft) or "3.5" <math>\times</math> 4 ft</p> <p>A1 cao</p>
10	(a)		1.8%	<p>P1 for start to process eg. <math>2000 \times 1.025</math> (<math>=2050</math>)</p> <p>P1 for process to use all given information eg "2050" <math>\times m^2 = 2124.46</math>  <b>or</b> "<math>2050</math>" <math>\times \left(1 + \frac{x}{100}\right)^2 = 2124.46</math></p> <p>P1 for process to find their unknown eg <math>m = \sqrt{\frac{2124.46}{2050}}</math> (<math>= 1.01799\dots</math>)</p>
	(b)		200	<p>A1 for 1.79% <math>- 1.8\%</math></p> <p>M1 <math>225 \div 1.125</math> oe</p> <p>A1</p>

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

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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 <math>(2n + 1)^2</math> or <math>(2n + 1)\{(2n + 1) - 1\}</math></p> <p>P1 for <math>4n^2 + 2n</math> or equivalent expression in factorised form</p> <p>C1 for convincing statement using <math>2n(2n + 1)</math> or <math>2(2n^2 + n)</math> or <math>4n^2 + 2n</math> 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 <math>x = 0.2\dot{5}</math> so <math>10x = 2.5\dot{5}</math> then <math>9x = 2.3</math> leading to...</p> <p>A1 correct working to conclusion</p>
16		$\frac{2x+1}{3x+5}$	<p>M1 for <math>(3x \pm 5)(2x \pm 1)</math> or <math>(2x + 1)(2x - 1)</math></p> <p>M1 <math>\frac{1}{(3x \pm 5)(2x \pm 1)} \times (2x + 1)(2x - 1)</math></p> <p>A1</p>
17		4.89	<p>M1 <math>\frac{40}{360} \times 2 \times \pi \times 7</math> 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 <math>\frac{\sqrt{3.475}}{8.1315}</math> or <math>\frac{\sqrt{3.465}}{8.1325}</math></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)
		Sketch	P1 Parabola passes through all three of the points (-4, -1), (-2,2), (0, -1)
20		$x=0, y=5$ $x=-4, y=-3$	<p>M1 Initial process of substitution eg <math>x^2 + (2x + 5)^2</math> (=25)</p> <p>M1 for expanding and simplifying eg <math>x^2 + 4x^2 + 10x + 10x + 25</math> (=25)</p> <p>M1 Use of factorisation or correct substitution into quadratic formula or completing the square to solve an equation of the form <math>ax^2 + bx + c = 0, a \neq 0</math></p> <p>A1 correct values of <math>x</math> or <math>y</math></p> <p>C1 <math>x = 0, x = -4, y = 5, y = -3</math> correctly matched <math>x</math> and <math>y</math> values</p>

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21	(a)		130	<p>P1 start to process eg draw a labelled triangle or use of sine rule <math>\frac{\sin Q}{8.7} = \frac{\sin 32}{5.2}</math></p> <p>P1 process to find of <math>Q</math> eg <math>Q = \sin^{-1} \left[ \frac{\sin 32}{5.2} \times 8.7 \right]</math></p> <p>P1 process to find area of triangle <math>PRQ</math>.</p> <p>A1 22.5 – 22.6</p> <p>C1 angle <math>PRQ</math> is obtuse so need to find area of two triangles.</p>
	(b)			
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>