

Mark Scheme (Results)

Summer 2017

Pearson Edexcel International GCSE In Mathematics A (4MA0) Paper 4HR



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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.
- Types of mark
 - M marks: method marks
 - A marks: accuracy marks
 - B marks: unconditional accuracy marks (independent of M marks)

Abbreviations

- cao correct answer only
- ft follow through
- isw ignore subsequent working
- SC special case
- oe or equivalent (and appropriate)
- \circ dep dependent
- indep independent
- \circ eeoo each error or omission

• No working

If no working is shown then correct answers normally score full marks

If no working is shown then incorrect (even though nearly correct) answers score no marks.

• With working

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks.

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks.

If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

If there is no answer on the answer line then check the working for an obvious answer.

• Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: eg. Incorrect cancelling of a fraction that would otherwise be correct.

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect eg algebra.

Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

• Parts of questions

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

International GCS	SE Maths							
Apart from questions 9, 14, 17, 21b and 23 (where the mark scheme states otherwise) the correct answer, unless clearly obtained from an								
incorrect method, should be taken to imply a correct method.								
Q	Working	Answer	Mark		Notes			
1 (a)	Eg $\frac{30}{12} \times 110$ or 2.5×110 or $\frac{30}{12}$ or 2.5 or $\frac{110}{12} \times 30$ or $9.16(666) \times 30$ or $\frac{110}{12}$ or $9.16(666)$ oe		2	M1	Accept 9.16(666) rounded or truncated to at least 3 SF			
	12 12	275		A1				
	Eg $\frac{375}{100} \times 12 \text{ or } 3.75 \times 12 \text{ or}$ $375 \div \frac{100}{12} \text{ or } 375 \div 8.33(333) \text{ or}$ $\frac{12}{100} \times 375 \text{ or } 0.12 \times 375$		2	M1	For a complete method Accept 8.33(333) rounded to at least 3 SF			
	100	45		A1				
					Total 4 marks			

2 (a) (i)	5, 15	1	B1	
(ii)	5, 7, 9, 10, 11, 13, 15	1	B1	
(b)	4, 6, 8, 10, 12, 14	2	B2	B2 for all correct and none
				incorrect.
				If not B2 then B1 for 4 or more
				correct and no more than 1
				incorrect.
				Total 4 marks

3 (a)	14.37028405	2	M1 A1	102.66 or 1.843(9) or 7.143(9) Accept 14.37(028) rounded or truncated to at least 4SF
(b)	14.4	1	B1 ft	As long as from at least 4sf
				Total 3 marks

4	$10 \times 4.2 \times 7.5 \text{ or } 315 \text{ (cm}^3) \text{ oe}$		4	M1	For volume of cuboid
	Eg $0.5 \times 7 \times x \times 5$ or $17.5x$ oe			M1	indep
					For volume of triangular prism
	$10 \times 4.2 \times 7.5 = 0.5 \times 7 \times x \times 5 \text{ or } 17.5x = 315$			M 1	Dep on M2
	oe or				For a correct equation involving
	$\frac{10 \times 4.2 \times 7.5}{0.5 \times 7 \times 5} \text{ or } \frac{"315"}{"17.5"} \text{ oe}$				volume of cuboid and volume of
	$\frac{-0.5 \times 7 \times 5}{-0.5 \times 7 \times 5}$ or $\frac{-0.5 \times 7 \times 5}{-0.5 \times 7 \times 5}$ or				prism or
					For a correct expression for <i>x</i>
		18		A1	18
					SCB2 for For volume of cuboid =
					315 and final answer $= 9$
					Total 4 marks

5 (a)		12 - 28c	1	B1	
(b)		y(y + 8)	1	B1	
(c)	$x^2 - 3x + 7x - 21$		2	M1	For 3 correct terms or for 4 correct terms ignoring signs or for $x^2 + 4x + c$ for any non-zero value of <i>c</i> or for + $4x - 21$
		$x^2 + 4x - 21$		A1	cao
(d)	5p - 3p = 9 or $2p = 9$ or $-9 = 3p - 5p$ or $-9 = -2p$		2	M1	
		4.5		A1	oe
					eg $\frac{9}{2}$ or $4\frac{1}{2}$
(e)		y ¹¹	1	B1	
(f)		h^8	1	B1	
(g)		e^{15}	1	B1	
					Total 9 marks

6	(a)		$30 < d \le 40$	1	B1	Accept 30–40
-		$5\sqrt{5} + 15\sqrt{10} + 25\sqrt{17} + 25\sqrt{20} + 45\sqrt{6}$ or	50 < u <u></u>	1		1
	(b)	$5 \times 5 + 15 \times 12 + 25 \times 17 + 35 \times 20 + 45 \times 6$ or		4	M2	$f \times d$ for at least 4 products with
		25 + 180 + 425 + 700 + 270 or				correct mid- interval values and
		1600				intention to add.
						If not M2 then award M1 for
						d used consistently for at least 4
						products within interval (including
						end points) and intention to add
						or
						for at least 4 correct products with
						correct mid-interval values with no
						intention to add
		$\frac{25+180+425+700+270}{25+180+425+700+270}$ or $\left(=\frac{1600}{100}\right)$			M 1	dep on M1 (ft their products)
		$\frac{25+180+425+700+270}{5+12+17+20+6} \text{ or } \left(=\frac{1600}{60}\right)$				NB: accept their 60 if addition of
		3+12+17+20+0 (00)				frequencies is shown
			26.7		A1	Accept 26.6 – 26.7 inclusive
						Accept 27 if M3 awarded
						Do not accept fractions or mixed
						-
						numbers, eg $\frac{80}{3}$ or $26\frac{2}{3}$
						3 3
						Total 5 marks

7 (a)	$4x \ge 27 - 13 \text{ or } 4x \ge 14$ or $-4x \le 13 - 27 \text{ or } -4x \le -14$		2	M1	Accept an equation in place of an inequality or accept wrong inequality sign or accept 3.5 oe given as answer
		$x \ge 3.5$		A1	oe Must be the final answer
(b)		Correct line drawn	1	B1	For a closed circle at -1 with line that goes at least as far as 3 or for a closed circle at -1 with an arrow on a line pointing to the right
(c)		-2, -1, 0, 1, 2	2	B2	B1 for list with one error or omission: e.g. -2, -1, 0, 1, 2, 3; -1, 0, 1, 2; -2, -1, 1, 2; -3, -2, -1, 0, 1, 2 SCB1 for -3, -2, -1, 0, 1
					Total 5 marks

8	$(x^2 =) 18^2 - 13^2$ or $324 - 169$ or 155		3	M1	Squaring and subtracting
	$(x =) \sqrt{18^2 - 13^2}$ or $\sqrt{"155"}$			M1dep	for square rooting
		12.4		A1	Accept 12.4 – 12.46 inclusive
	Alternative Methods - Using Trigonometry				
	Eg sin ⁻¹ ($\frac{13}{18}$) and 18cos"46.2(382)" oe or			M2	For a complete method
	$\cos^{-1}(\frac{13}{18})$ and $18\sin''43.7(617)$ " oe				
				A1	Accept 12.4 – 12.46 inclusive
					Total 3 marks

9	Eg 9x = 22.5 or 18y = 27 or $-18y = -27$ or 5x - (13 - 4x) = 9.5 or $4x + 5x - 9.5 = 13$ or $5\left(\frac{13 - 2y}{4}\right) - 2y = 9.5$ or $4\left(\frac{9.5 + 2y}{5}\right) + 2y = 13$		3	M1	For a complete method to eliminate one variable (condone one arithmetic error)
	Eg 5 × "2.5" – 2y = 9.5 or 5x – 2 × "1.5" = 9.5	<i>x</i> = 2.5, <i>y</i> = 1.5		M1 A1	Dep on M1 For substituting the other variable or starting again to eliminate the other variable dep on M1 NB: candidates showing no correct working score 0 marks.
					Total 3 marks

10 (a)	22 000 000	1	B1
(b)	9.5×10^{5}	1	B1
			Total 2 marks

11	7500×0.04 or 300 or 7500×1.04 or 7800 or 7500×1.04^n ($n > 1$)		3	M1	For interest for first year or for $7500 \times 0.04 \times 3$ oe or 900 or for $7500 + 7500 \times 0.04 \times 3$ oe or an answer of 8400	M2 for 7500×1.04^3 oe
	Eg 7500 + $\frac{4}{100}$ × 7500 + $\frac{4}{100}$ × (7500 + "300") + $\frac{4}{100}$ × (7500 + "300" + "312") or 7500 + "300" + "312" + "324.48"	8436.48		M1	For a complete method	
				A1	Accept answers in the range 843 NB: Answer in the range 936 -9	
						Total 3 marks

12 (a)		$y = \frac{1}{2}x - 1$ oe	2	M1 A1	For $(y=) \frac{3}{6}x + c$ (c may be any number or letter) or For $(y=)mx-1$ where <i>m</i> is non- zero or for Gradient = $\frac{3}{6}$ oe or $m = \frac{3}{6}$ oe clearly stated For a fully a correct equation for L Eg $y = \frac{3}{6}x-1$ or $2y = x-2$ or
					6 $y - 1 = \frac{1}{2}(x - 4)$ or $y - 2 = \frac{1}{2}(x - 2)$ M1A0 for $L = \frac{1}{2}x - 1$ or $\frac{1}{2}x - 1$
(b)	$4 = "\frac{1}{2}" \times 5 + c \text{ or } y - 4 = "\frac{1}{2}"(x - 5)$	$y = \frac{1}{2}x + 1\frac{1}{2}$	2	M1ft A1	For correct substitution of given coordinate into their equation Follow through their gradient in (a) oe Eg $y = \frac{1}{2}(x+3)$ SCB1 for $(l =)\frac{1}{2}x + 1\frac{1}{2}$
					Total 4 marks

13	(Angle $ABD =$) $\tan^{-1}(\frac{5}{9})$ or (Angle $ADB =$) $\tan^{-1}(\frac{9}{5})$ or (Angle $ABC =$) $\cos^{-1}(\frac{9}{15})$ or (Angle $ACB =$) $\sin^{-1}(\frac{9}{15})$ ($BD =$) $\sqrt{9^2 + 5^2}$ or ($AC =$) $\sqrt{15^2 - 9^2}$ ($DC =$) $\sqrt{15^2 - 9^2} - 5$		4	M1	For correct method to find angle <i>ABD</i> or <i>ADB</i> or <i>ABC</i> or <i>ACB</i> or for correct method to find side <i>BD</i> , <i>AC</i> or <i>DC</i> .
				A1	For angle $ABD = 29.(0546)$ or for angle $ADB = 60.(9453)$ or for angle $ABC = 53.(1301)$ or for angle $ACB = 36.(8698)$ or For $BD = \sqrt{106}$ or $10.(2956)$ or for $AC = 12$ or for $DC = 7$ Accept rounded or truncated to at least 2SF
	Eg (x =) $\cos^{-1}(\frac{9}{15}) - \tan^{-1}(\frac{5}{9})$ or (x =) $180 - 90 - "29.(0546)" - "36.(8698)"$ or $\cos x = \frac{15^2 + "10.(2956)"^2 - 7^2}{2 \times 15 \times "10.(2956)"}$ or $\cos x = 0.913(009)$ or $\sin x = \frac{7\sin"36.(8698)"}{\sqrt{106}}$ or $\sin x = \frac{7\sin"119.(054)"}{15}$ or $\sin x = 0.407(940)$			M1	For a complete method to find x or $\sin x$ or $\cos x$ Accept $0.912 \le \cos x \le 0.9152$ Accept $0.407 \le \sin x \le 0.413$
		24		A1	Awrt 24
					Total 4 marks

14	6(5-x) - 6(x-1)		4	M1	For a clear intention to multiply
	$\frac{6(5-x)}{2} - \frac{6(x-1)}{3} = 6 \times 1$ or				both sides by 6 or a multiple of 6
	$2^{2} - 3^{3}$ 3(5-x) - 2(x - 1) = 6 or				or to express LHS as a single
					fraction with denominator of 6 or a
	$\frac{3(5-x)-2(x-1)}{6}$ (=1) or				multiple of 6 or to express LHS as
					the sum of 2 fractions with
	$\frac{3(5-x)}{6} - \frac{2(x-1)}{6}(=1)$				denominator of 6 or a multiple of 6
	6 6				denominator of 0 of a manuple of 0
	15 - 3x - 2x + 2 = 6 or	-		M1	Expanding brackets in a correct
	$\frac{15 - 3x - 2x + 2}{1} = 1$				equation.
	<u> </u>				-
	$\frac{15-3x}{2x-2} = 1$				
	$\begin{array}{cccccccccccccccccccccccccccccccccccc$			1	
	Eg - 3x - 2x = 6 - 2 - 15 or $-5x = -11$ or			M 1	dep on both preceding marks for a
	3x + 2x = 15 + 2 - 6 or $5x = 11$				correct rearrangement of a correct
					equation with terms in x on one
					side and numbers on the other.
		2.2		A1	oe
					Dependent on M2
					Total 4 marks

15 (a)(i)		61°	1	B1	
	(ii)		Alternate segment	1	B1	Dep on B1 for (a)(i)
			theorem			Accept alternate segment(s)
						Accept angles in alternate
						segments are equal or
						Accept Angle between a chord and
						a tangent is equal to the angle on
						the circumference subtended/made
						by the same chord
(b)	180 - (180 - (61 + 53))		2	M1	For 61 + 53 or 180 - 66
			114°		A1	cao
						Total 4 marks

16 (a)	$\frac{2}{6} \times \frac{1}{5}$ oe		2	M1	For a complete method
		$\frac{1}{15}$		A1	oe Eg $\frac{2}{30}$ Accept 0.066(666) rounded or truncated to at least 3 decimal places
(b)	$\frac{4}{6} \times \frac{3}{5} \text{ or } 0.4 \text{ or } \frac{2}{6} \times \frac{1}{5} \text{ or } 0.066(666) \text{ or}$ $\frac{1}{6} \times \frac{3}{5} \text{ or } \frac{3}{6} \times \frac{1}{5} \text{ or } 0.1 \text{ or } \frac{3}{6} \times \frac{2}{5} \text{ or } 0.2 \text{ or } \frac{2}{6} \times \frac{1}{5} \text{ or}$ $0.066(666)$		3	M1	One correct product that gives an even number
	$\frac{\frac{4}{6} \times \frac{3}{5} + \frac{2}{6} \times \frac{1}{5} \text{ or}}{\frac{1}{6} \times \frac{3}{5} + \frac{3}{6} \times \frac{1}{5} + \frac{3}{6} \times \frac{2}{5} + \frac{2}{6} \times \frac{1}{5}}$			M1	Sum of correct products
		$\frac{7}{15}$		A1	oe Accept 0.466(666) rounded or truncated to at least 3 decimal places

With Replacement $\frac{4}{6} \times \frac{4}{6}$ or 0.444(444) or $\frac{2}{6} \times \frac{2}{6}$ or 0.111(111) or $\frac{1}{6} \times \frac{3}{6}$ or $\frac{3}{6} \times \frac{1}{6}$ or 0.083(333) or $\frac{2}{6} \times \frac{2}{6}$ or 0.111(111) or $\frac{3}{6} \times \frac{3}{6}$ or 0.25 or $\frac{1}{6} \times \frac{1}{6}$ or 0.027(777) $\frac{4}{6} \times \frac{4}{6} + \frac{2}{6} \times \frac{2}{6}$ oe or $\frac{1}{6} \times \frac{3}{6} + \frac{3}{6} \times \frac{1}{6} + \frac{2}{6} \times \frac{2}{6} + \frac{3}{6} \times \frac{3}{6} + \frac{1}{6} \times \frac{1}{6}$ oe or or $\frac{5}{9}$ or 0.555(555)			M1 M1
Alternative method $1 - \left(\frac{2}{6} \times \frac{4}{5} + \frac{4}{6} \times \frac{2}{5}\right) \text{ oe}$	$\frac{7}{15}$	3	M2 A1 oe Accept 0.466(666) rounded or truncated to at least 3 decimal places
			Total 5 marks

		-		
17 $\frac{3\pm\sqrt{9+220}}{22} \text{ or } \frac{3\pm\sqrt{9+220}}{2\times11} \text{ or } \frac{3\pm\sqrt{(-3)^2220}}{2\times11} \text{ or } \frac{3\pm\sqrt{(-3)^2220}}{22}$ NB: denominator must be 2×11 or 22 and there must be evidence for correct order of operations in the numerator Do not accept sign error or omission of brackets		3	M2	Or for $\frac{3\pm\sqrt{(-3)^2-4\times11\times-5}}{2\times11}$ (allow partial correct evaluation) and $\frac{3\pm\sqrt{229}}{22}$ If not M2 then M1 for $\frac{3\pm\sqrt{(-3)^2-4(11)(-5)}}{2\times11}$ Condone one sign error in substitution; Condone omission of brackets Allow partial correct evaluation
	0.82 and -0.55		A1	for awrt 0.82 and awrt -0.55 Award M2 A1 for awrt 0.82, -0.55 with sufficient correct working that would gain at least M1
Alternative scheme				
$11[(x-\frac{3}{22})^2 - \frac{229}{484}]$ oe			M1	
$11[(x-\frac{1}{22})^2 - \frac{1}{484}]$ oe				

$\frac{3}{22} \pm \sqrt{\frac{229}{484}}$ oe		M1
	0.82 and -0.55	A1 for awrt 0.82 and awrt -0.55 Award M2 A1 for awrt 0.82, -0.55 with sufficient correct working that would gain at least M1
		Total 3 marks

18	$480 = k \times 5^2$ or $480 \propto k \times 5^2$ oe or		3	M1
	or $(k =) \frac{480}{5^2}$ or $(k =)$ 19.2 oe			
	$k \propto \frac{480}{5^2}$ or $k \propto 19.2$ oe			
	"19.2" × 1.5 ²			M1 Dep on M1
				or for $A = 19.2x^2$ oe
		43.2		A1 oe
				Total 3 marks

19	(a)	Frequency densities: 1.2, 2.8, 1.6, 0.4, 0.2		3	M1	For 3 or more correctly calculated freq densities or For a correct scale indicated or 1 small square = 1 (person) 1 big square = 25 (people)
					M1	For at least 2 additional correct bars (with or without scale) Implies first M1
			A fully		A1	All 4 additional bars correct
			correct			
			histogram			
	(b)	$\begin{vmatrix} \frac{100}{150} \times 240 + 100 \text{ or } 1.6 \times 100 + 100 \text{ or } ``160'' + 100 \\ \text{oe} \end{vmatrix}$		2	M1	A fully complete method to find the number of people who took from 200 to 300 minutes + 100
		or $600 - (120 + 140 + \frac{1}{3} \times 240)$ or				
		$600 - (120 + 140 + 50 \times 1.6))$ or $600 - 340$ oe				
			260		A1	
						Total 5 marks

20 (a)		-5	1	B1
(b)		23	1	B1
(c)	$(f(-7)) = \frac{1}{-7+5}$ or $(f(-7)) = -\frac{1}{2}$ or		2	M1
	$2\left(\frac{1}{-7+5}\right)+3 \text{ or } 2 \times -\frac{1}{2}+3$			
		2		A1
(d)	$x-3=2y \text{ or } \frac{x}{2}=y+\frac{3}{2} \text{ or}$		2	M1
	$y-3 = 2x \text{ or } \frac{y}{2} = x + \frac{3}{2} \text{ or}$			
	$x-3 = 2y \text{ or } \frac{x}{2} = y + \frac{3}{2} \text{ or}$ $y-3 = 2x \text{ or } \frac{y}{2} = x + \frac{3}{2} \text{ or}$ $\frac{y-3}{2} \text{ or } \frac{y}{2} - \frac{3}{2}$			
				A 1
		$\frac{x-3}{2}$		A1 oe
		2		$\operatorname{Eg} \frac{x}{2} - \frac{3}{2}$
				Total 6 marks

		21 (1	D 1	0
21 (a) (i)		3 b – 6 a	I	B1	Oe
					Need not be simplified
					Mark the final answer
(ii)		$2\mathbf{b} - 4\mathbf{a}$	1	B1ft	$oe eg \frac{2}{3}('3b - 6a')$
					Need not be simplified
					Mark the final answer
(iii)		6 b – 3 a	1	B1	oe
					Need not be simplified
					Mark the final answer
(b)	Eg $\overrightarrow{XY} = 2\mathbf{b} - \mathbf{a}$ oe or $\overrightarrow{YB} = 4\mathbf{b} - 2\mathbf{a}$		2	M1	Work out \overrightarrow{XY} or \overrightarrow{YX} or \overrightarrow{YB} or \overrightarrow{BY}
		shown		A1	Dep on M1
					Correct conclusion from correct
					simplified vectors
					Eg $\overrightarrow{XB} = 3\overrightarrow{XY}$ or $\overrightarrow{YB} = 2\overrightarrow{XY}$ or
					$\overrightarrow{XB} = 1.5\overrightarrow{YB}$
					or <i>XB</i> and <i>XY</i> are parallel
					or YB and XY are parallel
					or XB and YB are parallel
					Total 5 marks

22			4	B1	Identifying correct triangle
	$\sqrt{8^2 + 15^2}$ or $\sqrt{289}$ or 17			M1	Complete method to find <i>MG</i>
	Eg tan24 = $\frac{BG}{\sqrt{8^2 + 15^2}}$ or tan24 = $\frac{BG}{17}$ or $\frac{BG}{\sin 24} = \frac{\sqrt{8^2 + 15^2}}{\sin(90 - 24)}$ or $\frac{BG}{\sin 24} = \frac{17}{\sin 66}$ (BG =) 17tan24 or (BG=) $\frac{17}{\sin 66} \times \sin 24$			M1	Dep For a correct equation involving BG or a correct expression for BG Implies B1
		7.57		A1	Accept 7.56 – 7.57
					Total 4 marks

23	27.25 or 27.35 or 17.5 or 18.5 or 9.805 or 9.815		3	B1	Accept 27.349 or 27.3499 or 18.49 or 18.499 or 9.8149 or 9.81499
	$(t=)\frac{27.25-18.5}{9.815}$			M1	For $\frac{LB - UB_1}{UB_2}$ oe where
					$\begin{array}{l} 27.25 \leq LB < 27.3 \\ \text{and} \ 18 < UB_1 \leq 18.5 \\ \text{and} \ 9.81 < UB_2 \leq \ 9.815 \end{array}$
		0.891		A1	dep on seeing $\frac{27.25-18.5}{9.815}$ Correct working must be seen Accept 0.891 - 0.8915
					Total 3 marks

24	Eg $12.6^2 = 10.4^2 + 18^2 - 2 \times 10.4 \times 18 \times \cos L$ or $158.76 = 108.16 + 324 - 374.4 \cos L$		5	M1	Correct substitution into cosine rule to find <i>L</i> or
	Note: $\cos K = \frac{-57.08}{262.08} (= -0.217(796))$ and $K = 102.(579)$ $\cos M = \frac{374.6}{453.6} (= 0.825(837))$ and $M = 34.3(264)$				For $\cos K = \frac{10.4^2 + 12.6^2 - 18^2}{2 \times 10.4 \times 12.6}$ oe AND $\sin L = \frac{12.6 \sin "102.(579)"}{18}$ or For $\cos M = \frac{18^2 + 12.6^2 - 10.4^2}{2 \times 18 \times 12.6}$ oe AND $\sin L = \frac{12.6 \sin "34.3(264)"}{10.4}$
	Eg cosL = $\frac{10.4^2 + 18^2 - 12.6^2}{2 \times 10.4 \times 18}$ or cosL = $\frac{273.4}{374.4}$ or cosL = 0.73(0235) oe or L = 43.0(938)			A1	Rearranging cosine rule correctly. Accept $L = 43^{\circ}$ Accept 43.0(938) rounded or truncated to at least 3 SF
	(Area of sector =) $\frac{"43.0(938)"}{360} \times \pi \times 10.4^2$ or 40.6(752)			M1	Dep on at least M1 Accept 40.5 – 40.7
				B1	For (area of triangle=) 63.9(471) Accept 63.8 - 64.0
		23.3		A1	Accept 23.2 – 23.3
					Total 5 marks

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