



This memorandum consists of 9 pages.

Important Information:

- This is a marking guideline. In instances where learners have used different but mathematically sound strategies to solve the problems they (learners) should be credited.
- Unless stated otherwise, learners who give a correct answer only, should be awarded full marks.
- Underline errors committed by learners and apply Consistent Accuracy (CA) marking.
- Do not penalise learners if units of measurement are omitted.

KEY	
M	Method mark
CA	Consistent Accuracy mark
A	Accuracy mark

QUESTION 1

1.	1.1	D	1.2	C	1.3	B	1.4	A	1.5	D	Give 1 mark for each correct answer.	[10]
	1.6	C	1.7	C	1.8	D	1.9	B	1.10	D		

QUESTION 2

2.1	$2,07 \times 10^{-7}$ ✓ A	Answer: 1 mark	(1)
2.2.1	$\sqrt[3]{73 - (-3)^2} = \sqrt[3]{73 - 9}$ $= \sqrt[3]{64}$ ✓ M $= 4$ ✓ CA	Calculation: 1 mark Answer: 1 mark (Answer only: 1 mark) (If the answer is a decimal number, no mark)	(2)
2.2.2	$\sqrt{100} < \sqrt{110} < \sqrt{121}$ ✓ M $10 < \sqrt{110} < 11$ ✓ A	$\sqrt{100}$ and $\sqrt{121}$: 1 mark Answer: 1 mark (Answer only: 1 mark)	(2)
2.2.3	$\frac{3 \times 5^9}{5^7} = 3 \times 5^2$ ✓ M $= 75$ ✓ CA	Applying exponential law: 1 mark Answer: 1 mark (Answer only: 1 mark)	(2)
2.3	$1,03 \times 10^{-2} + 3,8 \times 10^{-3}$ $= 0,0103 + 0,0038$ ✓ M $= 0,0141$ ✓ CA	Simplification: 1 mark Answer: 1 mark (Answer only: 1 mark)	(2)
	or	or	
	$= 10^{-2}(1,03 + 0,38)$ ✓ M $= 10^{-2}(1,41)$ $= 0,0141$ ✓ CA	or $= 10^{-3}(10,3 + 3,8)$ ✓ M $= 10^{-3}(14,1)$ $= 0,0141$ ✓ CA	
			[9]

QUESTION 3

3.1	$2(x + 2)^2 - (2x - 1)(x + 2)$ $= 2(x^2 + 4x + 4) - (2x^2 + 3x - 2) \checkmark\checkmark\mathbf{M}$ $= 2x^2 + 8x + 8 - 2x^2 - 3x + 2 \checkmark\mathbf{M}$ $= 5x + 10 \checkmark\mathbf{CA}$		Squaring a binomial: 1 mark Product of 2 binomials: 1 mark Simplification: 1 mark Answer: 1 mark		
	or		or		
	$= (x + 2)(2(x + 2) - (2x - 1)) \checkmark\checkmark\mathbf{M}$ $= (x + 2)(2x + 4 - 2x + 1) \checkmark\mathbf{M}$ $= (x + 2)(5) \text{ or } 5x + 10 \checkmark\mathbf{CA}$		Taking out common factor (x + 2): 1 mark $2(x + 2) - (2x - 1)$: 1 mark Simplification: 1 mark Answer: 1 mark	(4)	
3.2	$\frac{15x^2y^3 + 9x^2y^3}{8x^2y^3}$ $= \frac{24x^2y^3}{8x^2y^3} \checkmark\mathbf{M}$ $= 3 \checkmark\mathbf{CA}$	or	$\frac{15x^2y^3}{8x^2y^3} + \frac{9x^2y^3}{8x^2y^3}$ $= \frac{15}{8} + \frac{9}{8} \checkmark\mathbf{M}$ $= \frac{24}{8}$ $= 3 \checkmark\mathbf{CA}$	Simplification: 1 mark Answer: 1 mark	(2)
3.3	$\frac{x^2 - 4x}{x^2 - 2x - 8}$ $= \frac{x(x - 4)}{(x - 4)(x + 2)} \checkmark\checkmark\mathbf{M}$ $= \frac{x}{x + 2} \checkmark\mathbf{CA}$		$x(x - 4)$: 1 mark $(x - 4)(x + 2)$: 1 mark $\frac{x}{x + 2}$: 1 mark	(3)	
3.4	$\frac{x^2}{2} + \frac{2x^2}{3} - \frac{7x^2}{6}$ $= \frac{3x^2 + 4x^2 - 7x^2}{6} \checkmark\checkmark\mathbf{M}$ $= \frac{0}{6}$ $= 0 \checkmark\mathbf{CA}$		$3x^2 + 4x^2 - 7x^2$: 1 mark Common denominator 6: 1 mark Answer: 1 mark (If the expression is treated as an equation, no mark i.e. \times by 6)		
	or		or		
	$\frac{x^2}{2} + \frac{2x^2}{3} - \frac{7x^2}{6}$ $= \frac{3x^2}{6} + \frac{4x^2}{6} - \frac{7x^2}{6} \checkmark\checkmark\mathbf{M}$ $= \frac{0}{6}$ $= 0 \checkmark\mathbf{CA}$		Common denominator: 2 marks Answer: 1 mark (If the expression is treated as an equation, no mark i.e. \times by 6)	(3)	
3.5	$\frac{6x^2}{7xy} \times \frac{3y^3}{2x}$ $= \frac{9y^2}{7} \checkmark\checkmark\mathbf{A}$		$9y^2$: 1 mark 7: 1 mark		
	or		or		
	$= \frac{18x^2y^3}{14x^2y}$ $= \frac{9y^2}{7} \checkmark\checkmark\mathbf{A}$		$9y^2$: 1 mark 7: 1 mark	(2)	
				[14]	

QUESTION 4

4.1	$3x^2y - 9xy^2 + 12x^3y^3$ $= 3xy(x - 3y + 4x^2y^2)$ ✓✓A	$3xy$: 1 mark $x - 3y + 4x^2y^2$: 1 mark	(2)
4.2	$2(x + y) - t(x + y)$ $= (x + y)(2 - t)$ ✓✓A	$(x + y)$: 1 mark $(2 - t)$: 1 mark	(2)
4.3	$4x^2 - y^2$ $= (2x - y)(2x + y)$ ✓✓A or $(2x + y)(2x - y)$ ✓✓A	$(2x - y)$: 1 mark $(2x + y)$: 1 mark	(2)
4.4	$x^2 - 11x + 18$ $= (x - 9)(x - 2)$ ✓✓A or $(x - 2)(x - 9)$ ✓✓A	$(x - 9)$: 1 mark $(x - 2)$: 1 mark	(2)
			[8]

QUESTION 5

5.1	$(x - 2)^2 + 3x - 2 = (x + 3)^2$ $x^2 - 4x + 4 + 3x - 2 = x^2 + 6x + 9$ ✓✓M $x^2 - x + 2 = x^2 + 6x + 9$ $-7x = 7$ ✓ $x = -1$ ✓CA	$x^2 - 4x + 4$: 1 mark $x^2 + 6x + 9$: 1 mark Simplification: 1 mark Answer: 1 mark	(4)
5.2	$x^2 - 5x - 6 = 0$ $(x - 6)(x + 1) = 0$ ✓M or $(x + 1)(x - 6) = 0$ ✓M $x - 6 = 0$ or $x + 1 = 0$ $(x + 1) = 0$ or $(x - 6) = 0$ $x = 6$ or $x = -1$ ✓CA $x = -1$ or $x = 6$ ✓CA	Factors: 1 mark Both answers: 1 mark	(2)
5.3	$\frac{x + 2}{3} - \frac{x - 3}{4} = 0$ × by 12: $4(x + 2) - 3(x - 3) = 0$ ✓M $4x + 8 - 3x + 9 = 0$ ✓M $x = -17$ ✓CA	Multiplying by LCD: 1 mark Simplification: 1 mark Answer: 1 mark	(3)
			[9]

QUESTION 6

6.1	Position in the sequence (n)	1	2	3	4	5
	Term (T_n)	1	8	27	64✓A	125✓A
(2)						
6.2	$T_n = n^3$ ✓A				Answer: 1 mark	(1)
6.3	$T_n = 512$ $n^3 = 512$ ✓M $n^3 = 8^3$ or $n = \sqrt[3]{512}$ $\therefore n = 8$ ✓A				Substitution : 1 mark Answer: 1 mark (If $T_n \neq n^3$ 1 mark for substitution from 6.2)	(2)
						[5]

QUESTION 7

7.1.	$\text{Gradient} = \frac{\text{change in } y \text{ value}}{\text{change in } x \text{ value}} \checkmark \mathbf{M}$ $= \frac{5-0}{0-1} \checkmark \mathbf{M}$ $= \frac{5}{-1}$ $= -5 \checkmark \mathbf{A}$	Formula: 1 mark Substitution : 1 mark Answer: 1 mark Answer only: 3 marks	(3)
7.2	$y = -5x + 5$ ✓✓CA	-5: 1 mark +5: 1 mark	(2)
7.3	Gradient = -5 (parallel lines have equal gradients) ✓CA	Answer: 1 mark	(1)
			[6]

QUESTION 8

8.1	$\text{Decreased mass} = 240 - \left(\frac{15}{100} \times 240\right) \text{ kg}$ $= (240 - 36) \text{ kg} \checkmark \mathbf{A}$ $= 204 \text{ kg} \checkmark \mathbf{A}$	36: 1 mark Answer: 1 mark	(2)
	or $\text{Decreased mass} = 85\% \text{ of } 240 \text{ kg}$ $= \left(\frac{17}{20} \times 240\right) \text{ kg} \checkmark \mathbf{A}$ $= 204 \text{ kg} \checkmark \mathbf{A}$	$\frac{17}{20}$: 1 mark Answer: 1 mark	
8.2	$\text{Number of litres} = \frac{420 \text{ km}}{12 \text{ km/l}} \checkmark \mathbf{CA}$ $= 35 \checkmark \mathbf{A}$	$\frac{420 \text{ km}}{12 \text{ km/l}}$: 1 mark Answer: 1 mark	(2)
8.3	$\begin{array}{l} \text{Number of boys: number of girls : total number} \\ = 5 : 6 : 11 \\ \text{Number of boys} = \frac{5}{11} \checkmark \mathbf{A} \times 44 \checkmark \mathbf{M} \\ = 20 \checkmark \mathbf{A} \end{array}$	$\frac{5}{11}$: 1 mark $\times 44$: 1 mark Answer: 1 mark	(3)

8.4	Neither direct nor indirect proportion. ✓ A Reason: Area ≠ a constant x length and Area x length ≠ a constant. ✓	Neither direct nor indirect proportion: 1 mark Reason: 1 mark Note: Direct proportion with explanation (as the side of the square increases the area increases): 1 mark (If answer is indirect proportion, no mark)	(2)
8.5	$SI = \frac{P \cdot n \cdot r}{100}$ ✓ M $R840 = \frac{R4\,000(n)(3)}{100}$ ✓✓✓ M $84\,000 = 12\,000n$ ✓ M $n = \frac{84\,000}{12\,000}$ $n = 7$ ✓ A Number of years = 7	Formula: 1 mark Substitution <i>SI</i> : 1 mark Substitution <i>P</i> : 1 mark Substitution <i>r</i> : 1 mark Calculation: 1 mark Answer: 1 mark	
	or	or	
	$A = P + SI$ $A = R\,4840$ ✓ A $A = P(1 + ni)$ ✓ M $R4\,840 = R4\,000(1 + n(\frac{3}{100}))$ ✓✓ M $R4\,840 = R4\,000(1 + n(0,003))$ $R4\,840 = R4\,000 + R120n$ ✓ M $120n = 840$ $n = 7$ ✓ CA Number of years = 7	$R\,4840$: 1 mark Formula: 1 mark Substitution <i>P</i> : 1 mark Substitution <i>r</i> : 1 mark Calculation: 1 mark Answer: 1 mark	(6)
8.6	$A = P(1 + i)^n$ ✓ M $= R600(1 + 0,06)^2$ ✓✓ M $= R600(1,06)^2$ $= R674,16$ ✓ A	Formula: 1 mark Substitution <i>P</i> : 1 mark Substitution <i>i</i> = 0,06: 1 mark Answer: 1 mark	(4)
			[19]

QUESTION 9

9.1.1	$\hat{D} + \hat{F} = 90^\circ$ or their sum is 90° ✓ A	Answer: 1 mark	(1)
9.1.2	180° ✓ A	Answer: 1 mark	(1)
9.1.3	360° ✓ A	Answer: 1 mark	(1)
9.1.4	parallel ✓ A	Answer: 1 mark	(1)
9.1.5	equal ✓ A	Answer: 1 mark	(1)

9.2	Statement	Reason	Correct statement : ½ mark Reason: ½ mark Correct statement : ½ mark Reason: ½ mark Correct statement : ½ mark Reason: ½ mark	(3)
	$\hat{B}_1 = \hat{C}_1 = 65^\circ$	corr. \angle s and $AB \parallel TC$ ✓ A		
	$\hat{C}_2 = \hat{A} = 43^\circ$	alt. \angle s and $AB \parallel TC$ ✓ A		
	$\hat{B}_2 = 180^\circ - 65^\circ$ $= 115^\circ$	\angle s on a str. line or adj. suppl. \angle s ✓ A		
9.3	Statement	Reason	Correct statement : ½ mark Reason: ½ mark Correct statement : ½ mark Reason: ½ mark Substitution: ½ mark Answer: ½ mark	(3)
	$\hat{B} = \hat{C} = x$	\angle s opp. equal sides of Δ ✓ A		
	$\hat{A} + \hat{B} + \hat{C} = 180^\circ$	sum of \angle s of $\Delta = 180^\circ$ ✓ A		
	$\hat{A} + 2x = 180^\circ$	✓ A		
	$\hat{A} = 180^\circ - 2x$			
				[11]

QUESTION 10

10.1	Statement	Reason	Correct statement : 1 mark Reason: 1 mark	(2)
	$\Delta DEF \equiv \Delta PQR$ ✓ A	s \angle s ✓ A		
10.2	Statement	Reason	Correct statement : 1 mark Reason: 1 mark Correct statement : 1 mark Correct statement : 1 mark Reason: 1 mark Correct statement : 1 mark Reason: 1 mark Reason: 1 mark	(8)
	In ΔMNT and ΔMNP			
	$MT = MP$ ✓ A	equal radii ✓ A		
	$MN = MN$ ✓ A	common		
	$\hat{N}_1 = \hat{N}_2 = 90^\circ$ ✓ A	given or $MN \perp PT$ ✓ A		
	$\therefore \Delta MNT \equiv \Delta MNP$ ✓ A	90° hyp. s ✓ A		
	$\therefore PN = NT$	corr. sides of congruent Δ s or Δ s are congruent ✓ A		

or																	
	<table border="1"> <thead> <tr> <th>Statement</th> <th>Reason</th> </tr> </thead> <tbody> <tr> <td>In $\triangle MPN$ and $\triangle MTN$</td> <td></td> </tr> <tr> <td>$\hat{P} = \hat{T}$ ✓ A</td> <td>$\angle s$ opp. equal radii ✓ A</td> </tr> <tr> <td>$\hat{N}_1 = \hat{N}_2 = 90^\circ$ ✓ A</td> <td>given or $MN \perp PT$ ✓ A</td> </tr> <tr> <td>$MN = MN$ ✓ A</td> <td>common</td> </tr> <tr> <td>$\therefore \triangle MPN \equiv \triangle MTN$ ✓ A</td> <td>$\angle \angle s$ ✓ A</td> </tr> <tr> <td>$\therefore PN = NT$</td> <td>corr. sides of congruent Δs or Δs are congruent ✓ A</td> </tr> </tbody> </table>	Statement	Reason	In $\triangle MPN$ and $\triangle MTN$		$\hat{P} = \hat{T}$ ✓ A	$\angle s$ opp. equal radii ✓ A	$\hat{N}_1 = \hat{N}_2 = 90^\circ$ ✓ A	given or $MN \perp PT$ ✓ A	$MN = MN$ ✓ A	common	$\therefore \triangle MPN \equiv \triangle MTN$ ✓ A	$\angle \angle s$ ✓ A	$\therefore PN = NT$	corr. sides of congruent Δs or Δs are congruent ✓ A	<p>Correct statement : 1 mark Reason: 1 mark</p> <p>Correct statement : 1 mark Reason: 1 mark</p> <p>Correct statement : 1 mark</p> <p>Correct statement : 1 mark Reason: 1 mark</p> <p>Reason: 1 mark</p>	(8)
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10.3.1	<table border="1"> <thead> <tr> <th>Statement</th> <th>Reason</th> </tr> </thead> <tbody> <tr> <td>$BF = CE$</td> <td>given ✓ A</td> </tr> <tr> <td>$BF + FC = CE + FC$ ✓ A</td> <td></td> </tr> <tr> <td>$\therefore BC = EF$</td> <td></td> </tr> </tbody> </table>	Statement	Reason	$BF = CE$	given ✓ A	$BF + FC = CE + FC$ ✓ A		$\therefore BC = EF$		<p>Correct statement : ½ mark Reason: ½ mark</p> <p>Adding FC on both sides : 1 mark</p>	(2)
Statement	Reason										
$BF = CE$	given ✓ A										
$BF + FC = CE + FC$ ✓ A											
$\therefore BC = EF$											

10.3.2	<table border="1"> <thead> <tr> <th>Statement</th> <th>Reason</th> </tr> </thead> <tbody> <tr> <td>In $\triangle ABC$ and $\triangle DEF$</td> <td></td> </tr> <tr> <td>$AC = DF$</td> <td>given ✓ A</td> </tr> <tr> <td>$AB = DE$</td> <td>given ✓ A</td> </tr> <tr> <td>$BC = EF$</td> <td>proved ✓ A</td> </tr> <tr> <td>$\therefore \triangle ABC \equiv \triangle DEF$ ✓ A</td> <td>$s s s$ ✓ A</td> </tr> </tbody> </table>	Statement	Reason	In $\triangle ABC$ and $\triangle DEF$		$AC = DF$	given ✓ A	$AB = DE$	given ✓ A	$BC = EF$	proved ✓ A	$\therefore \triangle ABC \equiv \triangle DEF$ ✓ A	$s s s$ ✓ A	<p>Correct statement : ½ mark Reason: ½ mark</p> <p>Correct statement : ½ mark Reason: ½ mark</p> <p>Correct statement : ½ mark Reason: ½ mark</p> <p>Correct statement : 1 mark Reason: 1 mark</p>	(5)
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$BC = EF$	proved ✓ A														
$\therefore \triangle ABC \equiv \triangle DEF$ ✓ A	$s s s$ ✓ A														

10.3.3	<table border="1"> <thead> <tr> <th>Statement</th> <th>Reason</th> </tr> </thead> <tbody> <tr> <td></td> <td>corr. $\angle s$ of congruent Δs or $\triangle ABC \equiv \triangle DEF$ ✓ A</td> </tr> </tbody> </table>	Statement	Reason		corr. $\angle s$ of congruent Δs or $\triangle ABC \equiv \triangle DEF$ ✓ A	<p>Correct reason: 1 mark</p>	(1)
Statement	Reason						
	corr. $\angle s$ of congruent Δs or $\triangle ABC \equiv \triangle DEF$ ✓ A						

10.3.4	<table border="1"> <thead> <tr> <th data-bbox="236 226 630 286">Statement</th> <th data-bbox="630 226 1021 286">Reason</th> </tr> </thead> <tbody> <tr> <td data-bbox="236 286 630 360">$AB \parallel ED \checkmark \mathbf{A}$</td> <td data-bbox="630 286 1021 360">corr. \angles are equal $\checkmark \mathbf{A}$</td> </tr> <tr> <td colspan="2" data-bbox="236 360 1021 434">Accept</td> </tr> <tr> <td data-bbox="236 434 630 510">$AB = ED \checkmark \mathbf{A}$</td> <td data-bbox="630 434 1021 510">given $\checkmark \mathbf{A}$</td> </tr> </tbody> </table>	Statement	Reason	$AB \parallel ED \checkmark \mathbf{A}$	corr. \angle s are equal $\checkmark \mathbf{A}$	Accept		$AB = ED \checkmark \mathbf{A}$	given $\checkmark \mathbf{A}$	Correct statement : 1 mark Reason: 1 mark	(2)				
Statement	Reason														
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$AB = ED \checkmark \mathbf{A}$	given $\checkmark \mathbf{A}$														
10.4.1	<table border="1"> <thead> <tr> <th data-bbox="236 539 630 600">Statement</th> <th data-bbox="630 539 1021 600">Reason</th> </tr> </thead> <tbody> <tr> <td colspan="2" data-bbox="236 600 1021 674">In $\triangle ABD$ and $\triangle ACE$</td> </tr> <tr> <td data-bbox="236 674 630 748">$\hat{A} = \hat{A} \checkmark \mathbf{A}$</td> <td data-bbox="630 674 1021 748">common $\checkmark \mathbf{A}$</td> </tr> <tr> <td data-bbox="236 748 630 822">$\hat{B} = \hat{C} \checkmark \mathbf{A}$</td> <td data-bbox="630 748 1021 822">given $\checkmark \mathbf{A}$</td> </tr> <tr> <td data-bbox="236 822 630 896">$\hat{D}_1 = \hat{E}_1$</td> <td data-bbox="630 822 1021 896">sum of \angles of $\Delta = 180$</td> </tr> <tr> <td data-bbox="236 896 630 969">$\triangle ABD \parallel \triangle ACE \checkmark \mathbf{A}$</td> <td data-bbox="630 896 1021 969">$\angle \angle \angle \checkmark \mathbf{A}$</td> </tr> </tbody> </table>	Statement	Reason	In $\triangle ABD$ and $\triangle ACE$		$\hat{A} = \hat{A} \checkmark \mathbf{A}$	common $\checkmark \mathbf{A}$	$\hat{B} = \hat{C} \checkmark \mathbf{A}$	given $\checkmark \mathbf{A}$	$\hat{D}_1 = \hat{E}_1$	sum of \angle s of $\Delta = 180$	$\triangle ABD \parallel \triangle ACE \checkmark \mathbf{A}$	$\angle \angle \angle \checkmark \mathbf{A}$	Correct statement : 1 mark Reason: 1 mark Correct statement : 1 mark Reason: 1 mark Correct statement : 1 mark Reason: 1 mark	(6)
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$\hat{A} = \hat{A} \checkmark \mathbf{A}$	common $\checkmark \mathbf{A}$														
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10.4.2	<table border="1"> <thead> <tr> <th data-bbox="236 999 630 1059">Statement</th> <th data-bbox="630 999 1021 1059">Reason</th> </tr> </thead> <tbody> <tr> <td data-bbox="236 1059 630 1133">$\frac{AB}{AC} = \frac{BD}{CE} = \frac{AD}{AE} \checkmark \mathbf{A}$</td> <td data-bbox="630 1059 1021 1133">proportional sides of similar Δs $\checkmark \mathbf{A}$</td> </tr> <tr> <td data-bbox="236 1133 630 1207">$\frac{BD}{21} = \frac{9}{7} \checkmark \mathbf{M}$</td> <td data-bbox="630 1133 1021 1207"></td> </tr> <tr> <td data-bbox="236 1207 630 1281">$BD = \frac{9(21)}{7} \text{ cm} \checkmark \mathbf{M}$</td> <td data-bbox="630 1207 1021 1281"></td> </tr> <tr> <td data-bbox="236 1281 630 1357">$BD = 27 \text{ cm} \checkmark \mathbf{A}$</td> <td data-bbox="630 1281 1021 1357"></td> </tr> </tbody> </table>	Statement	Reason	$\frac{AB}{AC} = \frac{BD}{CE} = \frac{AD}{AE} \checkmark \mathbf{A}$	proportional sides of similar Δ s $\checkmark \mathbf{A}$	$\frac{BD}{21} = \frac{9}{7} \checkmark \mathbf{M}$		$BD = \frac{9(21)}{7} \text{ cm} \checkmark \mathbf{M}$		$BD = 27 \text{ cm} \checkmark \mathbf{A}$		Correct statement : 1 mark Reason: 1 mark Substituting $CE = 21$, $AD = 9$, $AE = 7$: 1 mark Making BD subject of formula: 1 mark Answer: 1 mark	(5)		
Statement	Reason														
$\frac{AB}{AC} = \frac{BD}{CE} = \frac{AD}{AE} \checkmark \mathbf{A}$	proportional sides of similar Δ s $\checkmark \mathbf{A}$														
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$BD = \frac{9(21)}{7} \text{ cm} \checkmark \mathbf{M}$															
$BD = 27 \text{ cm} \checkmark \mathbf{A}$															
			[31]												

QUESTION 11

11.1	<p>In $\triangle ABT$:</p> $AB^2 = AT^2 + BT^2 \checkmark \mathbf{M} \quad \text{Pythagoras}$ $(5)^2 = AT^2 + (3)^2$ $25 = AT^2 + 9$ $AT^2 = 16 \text{ cm}^2 \checkmark \mathbf{A}$ $AT = 4 \text{ cm} \checkmark \mathbf{A}$	Formula/substitution: 1 mark Calculations: 1 mark Answer: 1 mark	
or		or	
	<p>In $\triangle ABT$:</p> $AT^2 = AB^2 - BT^2 \checkmark \mathbf{M} \quad \text{Pythagoras}$ $= (25 - 9) \text{ cm}^2$ $= 16 \text{ cm}^2 \checkmark \mathbf{A}$ $AT = 4 \text{ cm} \checkmark \mathbf{A}$	Formula/substitution: 1 mark Calculations: 1 mark Answer: 1 mark	(3)

11.2.1	Perimeter of ADCT = $(4 + 12 + 5 + 9) \text{ cm}$ = 30 cm ✓CA		CA from 11.1 Answer: 1 mark	(1)	
11.2.2	Area of ADCT = $\frac{(AD+TC) \times AT}{2}$ ✓M = $\frac{(12+9) \times 4}{2} \text{ cm}^2$ ✓M = 42 cm^2 ✓CA	or	Area of ADCT = $\frac{1}{2}(\text{sum of parallel sides}) \times \text{height}$ ✓M = $\frac{(12+9) \times 4}{2} \text{ cm}^2$ ✓M = 42 cm^2 ✓CA	CA from 11.2.1 Formula: 1 mark Substitution: 1 mark Answer: 1 mark	(3)
11.3	$2\pi r = 52 \text{ cm}$ ✓M $\pi r = 26 \text{ cm}$ $r = 8,276 \dots \text{ cm}$ or $r = \frac{26}{\pi} \text{ cm}$ ✓A Area = πr^2 ✓M = $215,1774 \dots \text{ cm}^2$ $\approx 215,18 \text{ cm}^2$ ✓CA		Formula/substitution: 1 mark Answer: 1 mark Formula/substitution: 1 mark Rounded off answer: 1 mark If r is rounded off maximum: 3 marks Accept 215,29 or 215,09	(4)	
11.4	$k = 2$ ✓A			(1)	
				[12]	

QUESTION 12

12.1	$x = (\sqrt{8} + \sqrt{2})^2$ = $(\sqrt{8})^2 + 2\sqrt{8}\sqrt{2} + (\sqrt{2})^2$ ✓M = $8 + 8 + 2$ ✓M = 18 ✓CA		Squaring a binomial: 1 mark Simplifying: 1 mark Answer: 1 mark (Answer only: 1 mark)	
	or		or	
	$x = (\sqrt{8} + \sqrt{2})^2$ $x = (2\sqrt{2} + \sqrt{2})^2$ ✓M $x = (3\sqrt{2})^2$ ✓M $x = 18$ ✓CA		Simplifying: 1 mark Simplifying: 1 mark Answer: 1 mark (Answer only: 1 mark)	(3)
12.2	$\sqrt{\frac{1}{x}} = 3$ $\frac{1}{\sqrt{x}} = 9$ ✓M $\frac{1}{x} = 81$ ✓M $x = \frac{1}{81}$ ✓CA		Squaring both sides: 1 mark $\frac{1}{x} = 81$: 1 mark Answer: 1 mark (Answer only: 1 mark)	
	or		or	
	$\sqrt{\frac{1}{x}} = 3$ $\frac{1}{\sqrt{x}} = 9$ ✓M $x^{-\frac{1}{2}} = 3$ ✓M $x = 3^{-4}$ $x = \frac{1}{81}$ ✓CA		Squaring both sides: 1 mark $x^{-\frac{1}{2}} = 3$: 1 mark $x = \frac{1}{81}$: 1 mark (Answer only: 1 mark)	(3)
				[6]

Total: 140