

Question		Answer	Marks	Part Marks and Guidance	
1	(a)	$\pm 4$	3	<b>B2</b> for one solution Or <b>M1</b> for $y^2 = 16$	
	(b)	$4a - ac = 6 + 3c$  $a(4 - c) = 6 + 3c$ or FT  $[a =] \frac{6 + 3c}{4 - c}$ or $\frac{-3c - 6}{c - 4}$ or FT as final answer	M2  M1  M1	oe; for correctly collecting $a$ terms on one side, non- $a$ terms on the other; M1 if one sign error  For correct factorising; may be implied by final answer; FT if at least M1 gained  oe with numerator factorised; FT if at least M2 gained	may be done earlier

2	(a)	1.57	2	<b>M1</b> for other versions of 1.568... rot to 1 dp or more  Or <b>SC1</b> for 0.85	
	(b)	$12 - (1 + 4) \times 3 = -3$	1	p16 is attached below the image for 2b; put BP on p16 to show looked at – if relevant working for another qn, use the chain link to attach it to that qn	

Question			Answer	Marks	Part Marks and Guidance	
3	(a)	(i)	3 cao	1		
		(ii)	7 cao	1		
		(iii)	1 cao	1		

Question			Answer	Marks	Answer
3	(b)		eg $6^{-1} = \frac{1}{6}$ then appropriate division leading to 0.166 ... (at least 3 dp) so answer = $0.1\dot{6}$  As above but there may be any of <ul style="list-style-type: none"> <li>• an error in their calculation</li> <li>• lack of clarity</li> <li>• no sight of <math>\frac{1}{6}</math> or <math>1 \div 6</math></li> <li>• poor notation eg <math>0.1\dot{6}\dot{6}</math> or <math>0.16\dot{6}</math> or 0.16r etc</li> </ul> Nothing of any worth	3   2-1   0	For lower mark, sight of $\frac{1}{6}$ or 0.16[66...] with no recurring dot or attempt at a division leading to a decimal

4	(a)	$a = 3$ $b = 5$	2 2	<b>M1</b> for $3 = a(b^0)$ or $75 = a(b^2)$ seen <b>M1</b> for $75 = (\text{their } a)(b^2)$	a must be numerical
	(b)	1875	1		

5		$4, -4\sqrt{3}, [ + ][ 1 ] \sqrt{3}, -\sqrt{3}\sqrt{3}$ all seen $1 - 3\sqrt{3}$	M2 B1	<b>M1</b> for two of $4, -4\sqrt{3}, [ + ][ 1 ] \sqrt{3}, -\sqrt{3}\sqrt{3}$ seen	Allow -3 or $-\sqrt{9}$ or $-\sqrt{3^2}$ for $-\sqrt{3}\sqrt{3}$

6	(a)	47.52	1		
	(b)	15.2	1		

<b>7</b>	<b>(a)</b>	(i)	<b>1</b>		
		(ii)	<b>1</b>		
	<b>(b)</b>	(i) $^{10}$	<b>1</b>		
		(ii) $r^9$	<b>1</b>		
	<b>(c)</b>	(i)	<b>1</b>		
		(ii)	<b>2</b>	<b>M1</b> for $\sqrt[3]{27}$ or 3 seen as an 'answer'	

<b>8</b>	<b>(a)</b>		<b>6</b>	<b>1</b>		
	<b>(b)</b>		$5m$	<b>1</b>	cao	
	<b>(c)</b>		$\begin{array}{cccc} \checkmark & - & - & - \\ - & - & \checkmark & - \\ - & - & - & \checkmark \\ - & - & \checkmark & - \end{array}$	<b>3</b>	Allow <b>2</b> for 3 correct or <b>1</b> for 2 correct For 1 <sup>st</sup> answer condone 'formula'	

9	(a)		$7\sqrt{7}$ final answer	1		
	(b)		64 final answer	2	<b>M1</b> for $8^2$ or $(\sqrt{8} \times \sqrt{8}) = 8$ Or if $\sqrt{8} = 2\sqrt{2}$ allow if $(\sqrt{2})^4 = 4$	Identities must be clear

10	(a)		3	1		
	(b)		Any three of 8, $28\sqrt{3}$ , $10\sqrt{3}$ , $35\sqrt{9}$  $113 + 38\sqrt{3}$ isw	M2  B1	<b>M1</b> for any two of these	Accept $35 \times 3$ or 105 or $35\sqrt{3^2}$ for $35\sqrt{9}$  Final mark independent of method

11	(a)		0.59	2	<b>B1</b> for other rot versions of 0.58618...	
	(b)		$3 \times (6 + 5) - 1 = 32$	1	condone extra superfluous pairs of brackets	Attach image of page 16 to this part or to 4(b)

Question		Answer	Marks	Guidance
12		81, 664 ÷ 4 (oe) =166, 196, 1200 ÷ 5 =240	5	
		As above but with no methods (for % and/or fraction	4-3	For lower mark 3 or more correct values
		2 correct values	2-1	For lower mark 1 correct value
		Nothing of any worth.	0	

13	(a)	2.2 oe	1	Allow 11/5	
	(b)	(i) $2^2 \times 3^3 \times 5$ oe	3	Must have product; <b>M2</b> for fully correct factor tree or division Or <b>M1</b> for at least two of 2, 3 and 5 found / given as prime factors	Allow this <b>M1</b> even if errors in factor tree or division oe; may be obtained independently by divisibility tests
		(ii) 2700	2	<b>M1</b> for $540 \times 5$ or for $50 = 2 \times 5^2$ or for list of first 5 multiples of 540: [540], 1080, 1620, 2160, 2700 (condone one error in multiples, FT)	Allow <b>M1</b> for fully correct factor tree or division for 50

<b>14</b>	(a)		0.089	<b>2</b>	<b>B1</b> for other rot versions of 0.08854... to 2 or more dp  or <b>SC1</b> for answer 13.553 or 3.627	allow B1 for 0.089 seen in body and spoilt on answer line e.g. answer of 0.110 – bod wrong rounding
	(b)		700	<b>2</b>	<b>B1</b> for other rot versions of 718.40... to 2 or more sf	

<b>15</b>	(a)	(i)	4.18	<b>2</b>	<b>B1</b> for 4.177[....] seen	
		(ii)	1.4	<b>2</b>	<b>B1</b> for 1.42[....] seen	
		(iii)	0.0625 final answer	<b>1</b>		
	(b)		UB: 6549 LB: 6450	<b>1</b> <b>1</b>	Condone 6550  After <b>0</b> allow <b>SC1</b> for correct answers reversed	

16	(a)		7.84	2	<b>M1</b> for 481.89... seen (eg may be under root symbol) or for 2.8 seen	
	(b)		2.31 as final answer	2	<b>B1</b> for other rot versions of 2.30596... to at least 1 dp or for figs 231  Or <b>SC1</b> for 17.54 or 223.28 or 203.18	
	(c)		0.8 or $\frac{4}{5}$	1		