

UNIT 1: NON-CALCULATOR, HIGHER TIER

GCSE Mathematics Unit 1: Higher Tier	Mark	Comments
1. (a) $1 - (0.45 + 0.1 + 0.25)$ $= 0.2$	M1 A1	
(b) $0.1 + 0.25$ $= 0.35$	M1 A1	
(c) 0.1×0.25 $= 0.025$	M1 A1 6	
2. (a) -4 (b) Six correct plots. Curve drawn. (c) Correct solutions <u>from their graph</u> . (d) Line $y = -3$ drawn Correct roots <u>from their graphs</u> .	B1 B1 B1 B1 B2 B1 7	F.T. 'their (2, -4)'. F.T. 'their plots'. Answers should be accurate to within 1 small square. B1 for sight of $x^2 - 3x - 2 = -3$ or $y = -3$ F.T. if a straight line is drawn that intersects their curve twice. Answers should be accurate to within 1 small square.
3. (a) Correct construction of 60° . Correct bisector of 60° . (b) Exterior angle = $45^{(o)}$ (Number of sides =) $\frac{360}{45}$ $= 8$ (c) $\begin{pmatrix} 8 \\ -2 \end{pmatrix}$	B2 B1 B1 M1 A1 B1 7	With sight of accurate 'method arcs'. B1 for sight of 'method arcs' but not drawn accurately. F.T. 'their 60° '. With sight of accurate 'method arcs'. Penalise -1 if not drawn in correct position.
4. (a) (£)250 (b) $\frac{(\pounds)63 \times 100}{105}$ or equivalent e.g. $63 \div 1.05$ $= (\pounds)60$	B2 M1 A1 4	B1 for sight of (£)400/8 or (£)50.
5. (a) $1/8$ (b) 0.2222 . (c) 1	B1 B1 B1 3	

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6. (a) 0.2 AND 0.16 (b) Suitable uniform scale AND correct plots. (c) 0.16 AND e.g. 'because calculated from the greatest number of throws'. (d) Yes AND e.g. 'because 0.16 (or 80/500) is close to 1/6.	B1 B1 B1 B1 4	F.T 'their 0.2 and 0.16'. F.T 'their 0.16'. F.T 'their 0.16'.								
7. (a) 1.23×10^{-1} (b) 5×10^{-4}	B2 B2 4	B1 for a correct value not in standard form. e.g. 12.3×10^{-2} B1 for a correct value not in standard form. e.g. 0.5×10^{-3}								
8. $n^2 + 3$ or equivalent.	B2 2	B1 for $n^2 \pm \dots$ (not for n^2).								
9. Correct enlargement	B3 3	B2 for scale factor of $\frac{1}{2}$ with centre A. B1 for scale factor of $\pm\frac{1}{2}$ anywhere.								
10. (a) $y \propto 1/x^2$ OR $y = k/x^2$ $5 = k/2^2$ $y = 20/x^2$ (b) <table border="1" data-bbox="169 913 687 981"> <tr> <td>x</td> <td>2</td> <td>0.5</td> <td>(±)10</td> </tr> <tr> <td>y</td> <td>5</td> <td>80</td> <td>0.2</td> </tr> </table>	x	2	0.5	(±)10	y	5	80	0.2	B1 M1 A1 B2 5	Must be in correct form, not a F.T. F.T. non-linear only. B1 for each value.
x	2	0.5	(±)10							
y	5	80	0.2							
11. Sight of $4(x+2)(x+9)$ $(x+2)(x+9) = 912/4$ OR $4(x^2+2x+9x+18) = 912$ $x^2 + 11x - 210 = 0$ $(x+21)(x-10) = 0$ $x = 10$ or $x = -21$ Dimensions (4cm), 12(cm) and 19(cm) Statement about ignoring $x = -21$ as it leads to negative lengths Organisation and communication Accuracy of writing	B1 M1 A1 M1 A1 A1 EI OC1 W1 9	Must be in this form. Correct intermediate steps required before A1 awarded. F.T. from equivalent level of quadratic. Must have both solutions.								
12. (a) $16a^{12}$ (b) $\pm\sqrt{h^2 - a^2}$	B1 B1 2									

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<p>13. (a) $x = 0.47878\dots$ and $100x = 47.878\dots$ with an attempt to subtract. 474 / 990 ISW.</p> <p>(b) $16 - 4\sqrt{3} - 4\sqrt{3} + 3$ $= 19 - 8\sqrt{3}$ $a = 19$ AND $b = -8$</p> <p>(c) $\frac{1}{9}$</p>	<p>M1</p> <p>A1</p> <p>B1 B1 B1</p> <p>B2</p> <p>7</p>	<p>Or $10x$ and $100x$ with an attempt to subtract, or equivalent.</p> <p>An answer of $\frac{47.4}{99}$ gains M1 only.</p> <p>F.T. for addition of at least two irrational numbers. C.A.O.</p> <p>B1 for 9^{-1} or $\frac{1}{3^2}$ or $\frac{1}{\sqrt[3]{729}}$</p>
<p>14.(a) Concave down curve with y-coordinate of maximum = 4 x-coordinate of maximum = -3 Points (-7,0) AND (1, 0) shown.</p> <p>(b) Concave down curve that is symmetrical about the y-axis. (0, 3) indicated.</p> <p>(c) A comment regarding no scale or coordinates shown.</p>	<p>B1 B1 B1</p> <p>B1</p> <p>B1</p> <p>B1</p> <p>6</p>	<p><i>Allow appropriate marking of axes if coordinates not given.</i></p>
<p>15. Angle CAB = x (Reason) Alternate segment theorem.</p> <p>Angle ABC = $\frac{180-x}{2}$ (= $90 - \frac{1}{2}x$) (Reason) isosceles triangle.</p>	<p>B1 E1</p> <p>B1</p> <p>E1 4</p>	<p>May be indicated on the diagram. E1 dependent on previous B1.</p> <p>E1 dependent on previous B1.</p>
<p>16.(a) (i) Indicates sequence as 'Miss', 'Miss', 'Hit'. $0.7 \times 0.7 \times 0.3$ $= 0.147$</p> <p>(ii) Indicates three possible situations HMM or MHM or MMH 0.441 Less than a 50% chance.</p> <p>(b) Indicates that the first ball selected is returned to the box before the second ball is selected OR the two attempts are independent.</p>	<p>S1 M1 A1</p> <p>M1 A1 A1</p> <p>B1</p> <p>7</p>	<p>May be indicated by $0.3 \times 0.7 \times 0.7 \times 3$ or equivalent. F.T. 'their 0.147' $\times 3$ F.T. 'their 0.441'</p>