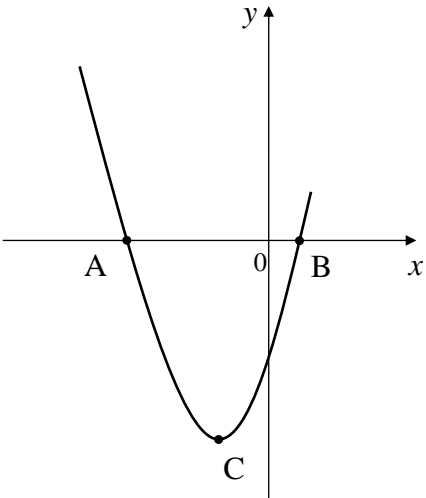
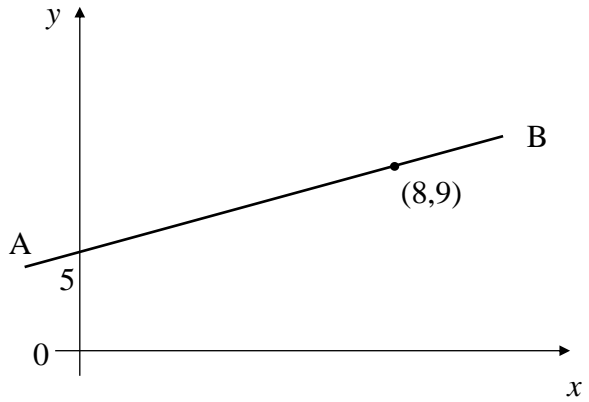
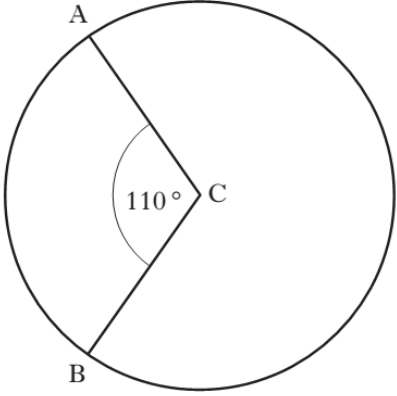
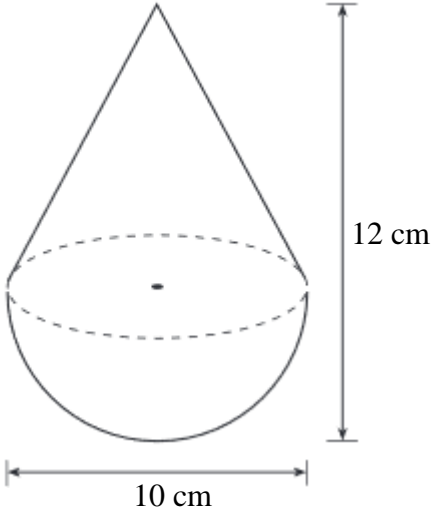
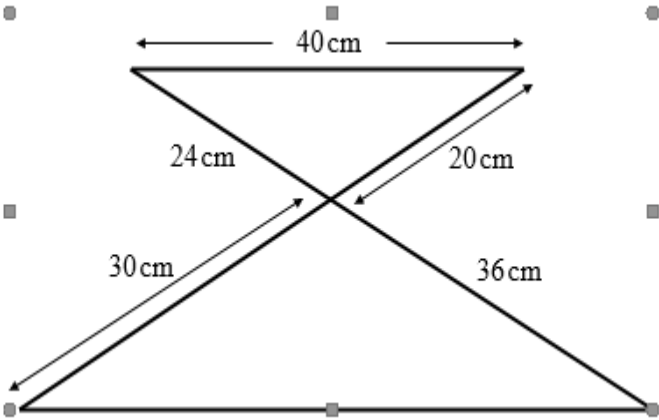


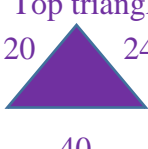
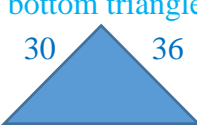
| | | |
|-----------|---|--------------------------|
| S4 | December A/B Revision 1 – Non Calculator | 20 |
| 1 | Multiply out the brackets and collect like terms $(2x + 3)(5x - 1)$ | 2 |
| 2 | Calculate $3\frac{1}{5} \times 1\frac{1}{4}$ | 2 |
| 3 | A function is given as $f(x) = 10 - 2x$ (a) Evaluate $f(-2)$ (b) If $f(t) = -6$, calculate a value for t | 1 2 |
| 4 | The line AB passes through the points (0,5) and (8,9) State the equation of the Line AB | 3 |
| 5 | Change the subject of the formula $F = \frac{t^2+b}{c}$ to b | 2 |
| 6 | Express in the simplest form $2a^7 \times (3a^4)^2$ | 3 |
| 7 | The diagram shows part of the graph of $y = x^2 + 6x - 16$ | |
| | (a) Find the coordinates of A and B, the x -intercepts for the graph. | 3 |
| | (b) State the coordinates of the minimum turning point C. | 2 |



| | | | |
|----|--|---|----------|
| S4 | December A/B Revision 1 – Calculator | 30 | |
| 1 | <p>The diagram to the right shows a circle with centre C.</p> <p>This circle has a radius of 2.6 cm</p> <p>Calculate the length of the major arc of this circle</p> |  | 3 |
| 2 |  | <p>A child's top is in the shape of a hemisphere with a cone on the top, as shown in the diagram.</p> <p>The toy is 10 cm wide and 12 cm high.</p> <p>Calculate the volume of this toy.</p> <p>Give your answer correct to 2 significant figures</p> | 5 |
| 3 | <p>For a Scottish election a tally was taken of the number of people who voted per hour for the first eight hours.</p> <p>The results for a polling station in Arran are as follows</p> <p style="text-align: center;">28 37 36 22 45 54 66 32</p> <p>(a) Calculate the mean and standard deviation for this data</p> <p>(b) At the same time a tally was taken in Dundee. The mean number of people voting per hour was 63 and the standard deviation was 11.2.</p> <p>Make two comparisons between the data recorded at both polling stations</p> | <p>4</p> <p>2</p> | |

| | | |
|---|--|---|
| 4 | <p>Gemma receives an 8.5% increase on her annual salary, After this increase her annual salary is now £24412.50</p> <p>What was Gemma’s original annual salary?</p> | 3 |
| 5 | <p>Solve the quadratic equation $4x^2 - 7x - 5 = 0$</p> <p>Give your answers correct to 1 decimal place.</p> | 4 |
| 6 | <p>A flat wire frame is made from two similar triangle, the dimensions of the frame are shown below.</p>  <p>This frame is made from one single length of wire bent into this shape. Would a two metre length of wire be sufficient to construct this frame?</p> <p>Give a reason for your answer.</p> | 4 |
| 7 | <p>Davina and Alexa both book into the Premier Inn in St Andrews</p> <p>Davina stays for 3 nights and has breakfast on 2 mornings, her bill comes to £172.</p> <p>Alexa stays for 2 nights and only eat breakfast one morning; her bill comes to £110.50</p> <p>Write two algebraic equations to illustrate this information and use these to find the cost of one night in this Premier Inn.</p> | 5 |

| Revision 1 Non Calculator Answers | |
|-----------------------------------|---|
| 1 | $(2x + 3)(5x - 1) = 10x^2 - 2x + 15x - 3 = 10x^2 + 13x - 3$ |
| 2 | $3\frac{1}{5} \times 1\frac{1}{4} = \frac{16}{5} \times \frac{5}{4} = 4$ |
| 3 | (a) $f(-2) = 10 - 2(-2) = 14$ (b) $10 - 2t = -6, 16 = 2t, t = 8$ |
| 4 | Gradient is $m = \frac{4}{8} = \frac{1}{2}$ Equation is $y = \frac{1}{2}x + 5$ |
| 5 | $F = \frac{t^2+b}{c}, \quad Fc = t^2 + b, \quad Fc - t^2 = b \rightarrow b = FC - t^2$ |
| 6 | $2a^7 \times (3a^4)^2 = 2a^7 \times 9a^8 = 18a^{15}$ |
| 7 | (a) $x^2 + 6x - 16 = 0$ $(x + 8)(x - 2) = 0$ A (-8, 0), B (2, 0) $x = -8$ and $x = 2$ (b) For turning point $x = -3, y = -25, \quad \mathbf{C (-3, -25)}$ |

| Revision 1 Calculator Answers | |
|-------------------------------|--|
| 1 | For major arc use $360^\circ - 110^\circ = 250^\circ$ Arc = $\frac{250^\circ}{360^\circ} \times \pi \times 5.2 = \mathbf{11.3 \text{ cm}}$ |
| 2 | Cone $V = \frac{1}{3} \times \pi \times 5^2 \times (12 - 5) \quad V = 183.2595715..$ Hemi-sphere $V = \frac{1}{2} \times \frac{4}{3} \times \pi \times 5^3 \quad V = 261.7993878..$ Volume is $183.259 + 261.79 = 445.05895.. = \mathbf{450 \text{ cm}^3}$ |
| 3 | Mean is 40 people St Dev = $\sqrt{\frac{1454}{7}} = \mathbf{14.412}$ On average more people voted per hour in Dundee and the number of voters was more consistent |
| 4 | $\pounds 24412.50 = 108.5\%$ so $\pounds \mathbf{22500} = \mathbf{100\%}$ |
| 5 | $x = \frac{-(-7) \pm \sqrt{(-7)^2 - 4 \times 4 \times (-5)}}{2 \times 4} \rightarrow x = \frac{7 \pm \sqrt{129}}{8}$ $x = 2.294727.., x = -0.544727$ so $x = \mathbf{2.3}$ and $x = \mathbf{-0.5}$ |
| 6 | <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>Top triangle</p>  <p>20 24</p> <p>40</p> </div> <div style="text-align: center;"> <p>bottom triangle</p>  <p>30 36</p> </div> <div style="text-align: left;"> <p>$SF = \frac{30}{20} = \frac{3}{2}$</p> <p>missing side is $40 \times \frac{3}{2} = 60\text{cm}$</p> <p>Sum of the sides is 210 cm or 2.1 m</p> <p>2.1m > 2 m, so 2m is not sufficient</p> </div> </div> |
| 7 | Simultaneous equations $3n + 2b = 172$ Scale $3n + 2b = 172$ $2n + b = 110.50$ $\underline{4n + 2b = 221}$ $n = 49$ <p style="text-align: center;">One night costs £49</p> |