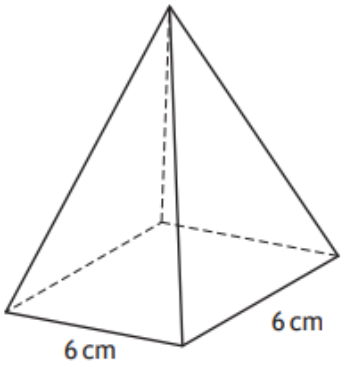
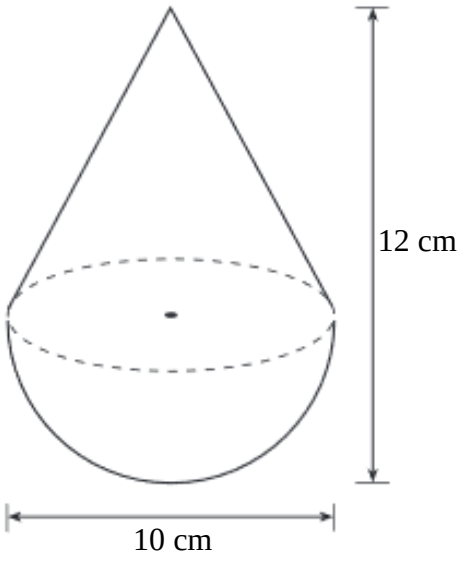
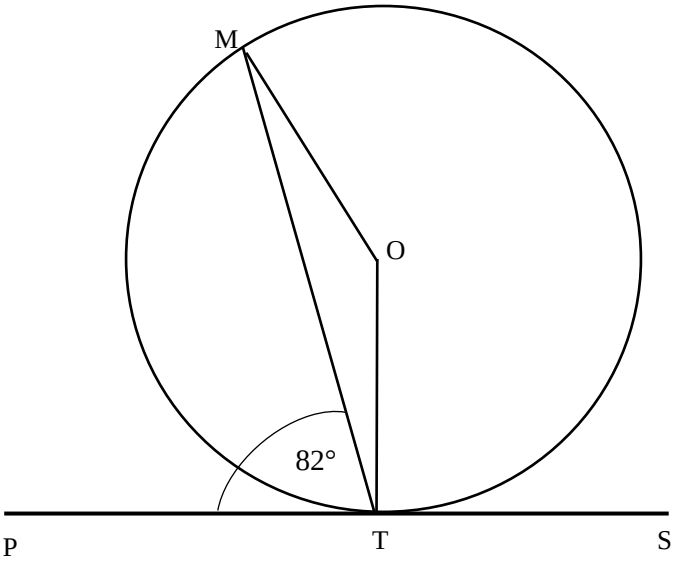
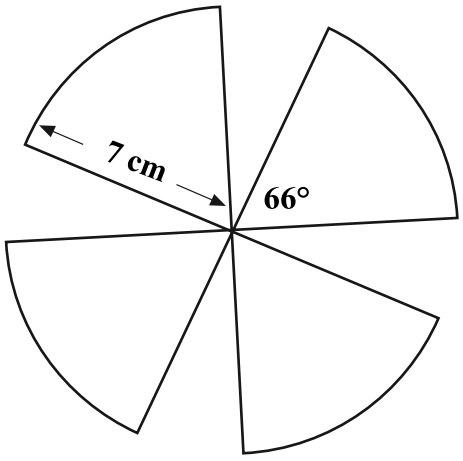
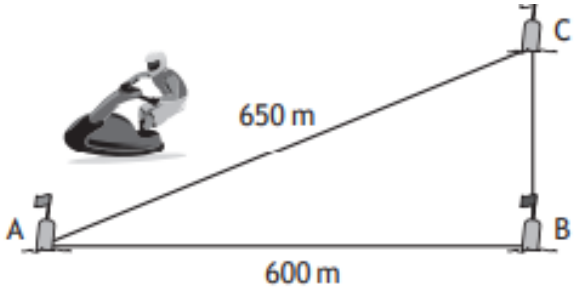
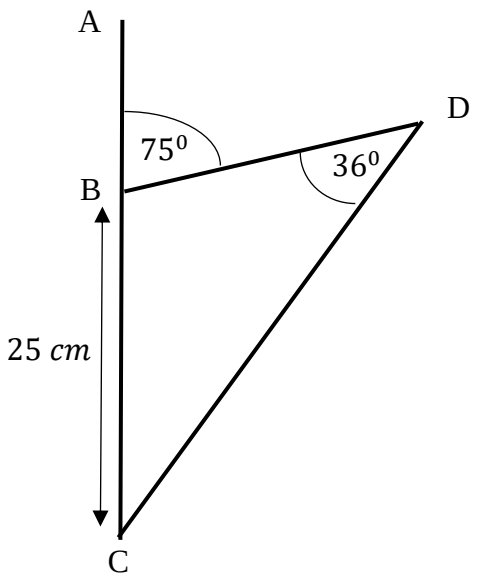
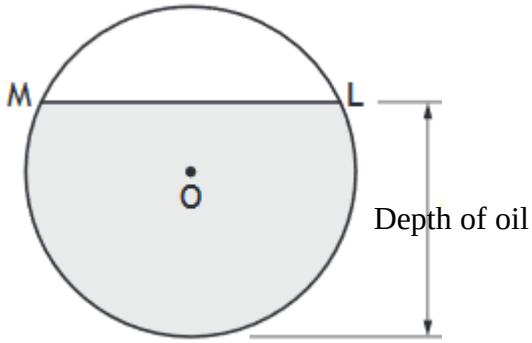
	Calculator Prelim Revision 1	**50**
1	Amir normally runs a total distance of 42 miles per week. Over the next four weeks he intends to increase his distance by 8% per week. How many miles will Amir run in his fourth week?	**3**
2	Find the magnitude of the vector $\boldsymbol{v} = \begin{pmatrix} \mathbf{2} \\ \mathbf{-3} \\ \mathbf{8} \end{pmatrix}$	**2**
3	A square based pyramid is shown below  The square base has length $6\ cm$ The volume of the pyramid is $150\ cm^3$ Calculate the height of the pyramid	**2**
4	Factorise $2x^2 + x - 10$	**2**
5	 A child's top is in the shape of a hemisphere with a cone on the top, as shown in the diagram. The toy is 10 cm wide and 12 cm high. Calculate the volume of this toy. Give your answer correct to **2 significant figures**	**5**

6	Solve the equation $2x^2 - 3x - 7 = 0$ Give your answer correct to one decimal place	**4**
7	For the circle below: • The tangent PS touches the circle, centre O, at T • Angle MTP is 82° • Radius OM and OT is 11 cm  (a) Calculate the size of angle MOT (b) In the triangle MOT calculate the length of side MT	**2** **2**
8	A fan is made from four identical plastic blades.  Each blade is a sector of a circle with a radius of 7 cm. The angle at the centre of each sector is 66°. Calculate the **total** area of plastic required to make the blades for this fan.	**4**

9	Simplify $\frac{4x^2}{a} \div \frac{3x^3}{a^4}$ $\quad a \neq 0$	**2**
10	The diagram shows the course for a jet-ski race. The total length of this course is 1500 metres.  Determine if the course contains a right-angled turn at marker B	**4**
11	Change the subject of the formula $t = \sqrt{\frac{g-3}{5}}$ to g	**3**
12	In the diagram • Angle ABD is $75°$ • Angle BDC is $36°$ • BC is 25 cm Calculate the length of DC 	**3**

13	Solve the equation $7\tan x° - 6 = 11, \ \ 0 \leq x \leq 360°$	**3**
14	The diagram below shows the circular cross section of an oil tanker.  The radius of the circle, centre O is 1.5 metres. The width of the surface of the oil in the tank, represented by ML in the diagram is 2.3 metres. Calculate the depth of the oil in the rank	**4**
15	A parabola has equation $y = x^2 - 4x + 7$ (a) Write the equation of the parabola in the form $y = (x - p)^2 + q$ (b) Sketch the graph of $y = x^2 - 4x + 7$. Clearly mark the coordinates of the turning point and the point of intersection with the y-axis	**2** **3**