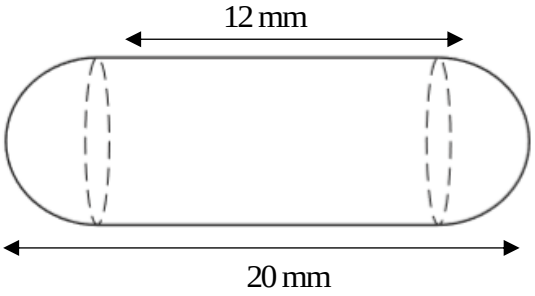
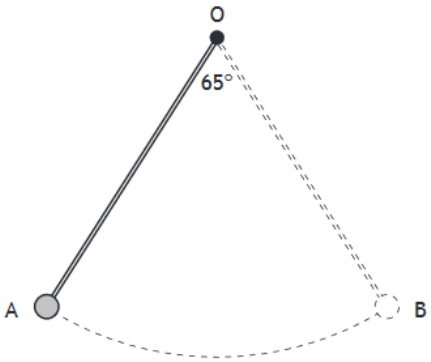
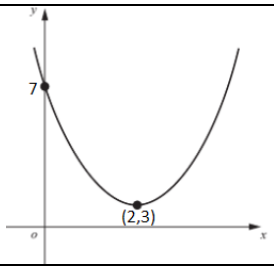
	S5 Nat 5 Revision 2 – Calculator	**30**
1	Simplify $\sqrt{2}(\sqrt{3}+\sqrt{2})-\sqrt{6}$	**3**
2	Jupiter's largest moon Io has a radius of approximately 1823 km. Calculate the volume of Io. Give your answer in scientific notation correct to **two significant figures**.	**2**
3	Factorise (a) x^2-16 (b) x^2-x-12 Hence simplify $\frac{x^2-16}{x^2-x-12}$	**1** **2** **2**
4	Solve algebraically the system of equations $2x+3y=3$ $5x+2y=13$	**3**
5	A parabola has equation $y=x^2-4x+7$ (a) Write the equation of the parabola in the form $y=(x-a)^2+b$ (b) Sketch the graph of $y=x^2-4x+7$. Clearly mark the turning point and the point where the graph passes through the y-axis.	 **2** **3**
6	A health food shop produces probiotic capsules for its customers. Each capsule is in the shape of a cylinder with hemispherical eds as show below  The total length of the capsule is 20 millimetres and the length of the cylinder is 15 millimetres. Calculate the volume of one capsule. Give your answer correct to **2 significant figures**.	**5**
7	Express $\frac{a}{b}\div\frac{a^2}{b}$ as a fraction is its simplest form	**2**
8	Simplify $n^4\times n^{-10}$ Give your answer with a positive power	**2**

9	The pendulum of a clock swings along an arc of a circle, centre O  The pendulum swings through an angle of 65°. The length of the pendulum AB is 16 centimetres. Calculate the length of arc AB.	**3**

	Revision 2 Non Calculator Answers
1	$\sqrt{2}(\sqrt{3}+\sqrt{2}) = \sqrt{6}+\sqrt{4}-\sqrt{6} = \sqrt{4} = \mathbf{2}$
2	$V = \frac{4}{3}\times\pi\times 1823^3 \ = 2.537748709\times 10^{10} = \mathbf{2.5\times 10^{10}\ km^3}$
3	$x^2-16 = (x+4)(x-4)$ $x^2-x-12 = (x-4)(x+3)$ $\frac{x^2-16}{x^2-x-12} = \frac{(x+4)(x-4)}{(x-4)(x+3)} = \frac{x+4}{x+3}$
4	$2x+3y=3$ Scale $10x+15y=15$ $5x+2y=13$ $10x+4y=26$ $11y = -11,\quad \boldsymbol{y=-1, x=3}$
5	 $x^2-4x+7 = (x-2)^2+3$ The turning point is $(2,3)$ and the y-intercept is 7 Sorry about the vertical scale on the graph
6	Find the volume of sphere $V_{sphere} = \frac{4}{3}\times\pi\times 4^3 = 268.0825$ Find the volume of the cylinder $V_{cylinder} = \pi\times 4^2\times 12 = 603.185$ Know that the volume of the capsule is found by addition $V_{sphere}+V_{cylinder}$ $V_{capsule} = V_{sphere}+V_{cylinder} = 871.2683626$ Correctly rounded answer with units $\boldsymbol{V = 870\ mm^3}$
7	$\frac{a}{b}\div\frac{a^2}{b} = \frac{a}{b}\times\frac{b}{a^2} = \frac{1}{a}$
8	$n^4\times n^{-10} = n^{-6} = \frac{1}{n^6}$
9	Arc $= \frac{65°}{360°}\times\pi\times 32 = \mathbf{18.15\ cm}$