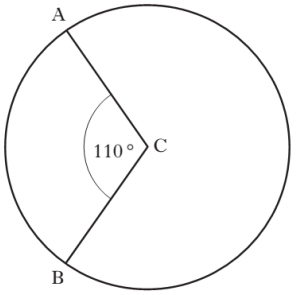
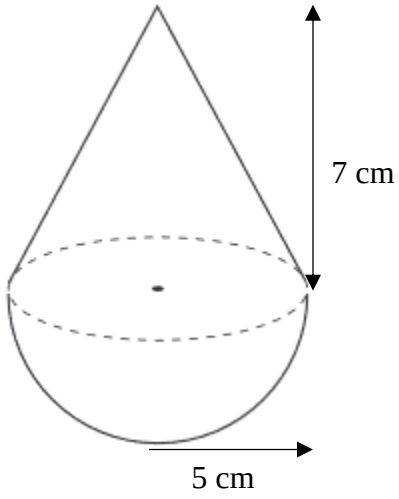
	S5 Nat 5 Revision 1 – Calculator	**30**
1	The diagram to the right shows a circle with centre C. This circle has a radius of 2.6 cm Calculate the area of the **minor** sector of this circle  	**3**
2	Factorise (a) $x^2 - x - 2$ (b) $4x^2 - 1$	**2** **2**
3	 This shape is a hemisphere with a cone on the top. The hemisphere has a radius of $5\ cm$. The cone has a radius of $5\ cm$ has a height of $7\ cm$. Calculate the volume of this toy. Give your answer correct to **2 significant figures**	**5**
4	Solve algebraically the system of equations $3x + 2y = 10$ $5x - y = 21$	**3**
5	Solve $2 - (x - 1) > 7$	**2**
6	State the gradient of the straight line between $A\ (10, -5)$ and $B(\ 50, 15)$. Give your answer in the simplest form	**2**
7	Express in the simplest form $2a^7 \times (3a^4)^2$	**3**

8	A parabola has equation $y = x^2 + 6x + 11$ (a) Write the equation of the parabola in the form $y = (x + a)^2 + b$ (b) State the coordinates of (i) The turning point of this parabola (ii) The point of intersection with the y-axis	 **2** **2** **1**
9	Express $\frac{2}{x+1} + \frac{3}{x-1}$, $x \neq -1,\ x \neq 1$ as a single fraction in its simplest form	 **3**

	Revision 1 Non Calculator Answers
1	Sector = $\frac{110°}{360°} \times \pi \times 2.6^2 = \mathbf{6.5\ cm^2}$
2	$x^2 - x - 2 = (x + 1)(x - 2)$ and $4x^2 - 1 = (2x + 1)(2x - 1)$
3	Cone $V = \frac{1}{3} \times \pi \times 5^2 \times 7$ $V = 183.2595715..$ Hemi-sphere $V = \frac{1}{2} \times \frac{4}{3} \times \pi \times 5^3$ $V = 261.7993878..$ Volume is $183.259 + 261.79 = 445.05895..$ = **450 cm³**
4	$3x + 2y = 10$ Scale $3x + 2y = 10$ $5x - y = 21$ $\underline{10x - 2y = 42}$ $13x = 52$ $x = 4$ Substitute into first equation $3(4) + 2y = 10,\ 2y = -2,\ y = -1$ Answer $x = 4,\ y = -1$
5	$2 - (x - 1) > 7 \rightarrow 2 - x + 1 > 7$ $\rightarrow 3 - x > 7 \rightarrow -x > 4$ *so* $\boldsymbol{x < -4}$
6	$m = \frac{15 - (-5)}{50 - 10} = \frac{20}{40} = \frac{1}{2}$
7	$2a^7 \times (3a^4)^2 = 2a^7 \times 9a^8 = \mathbf{18a^{15}}$
8	(a) $x^2 - 6x + 11 = (x + 3)^2 + 2$ (b) Turning point is $(-3, 2)$, y-intercept is $(0,11)$
9	$\frac{2}{x+1} + \frac{3}{x-1} = \frac{2(x-1) + 3(x+1)}{(x+1)(x-1)} = \frac{5x+1}{(x+1)(x-1)}$