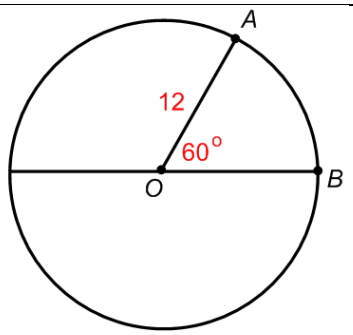
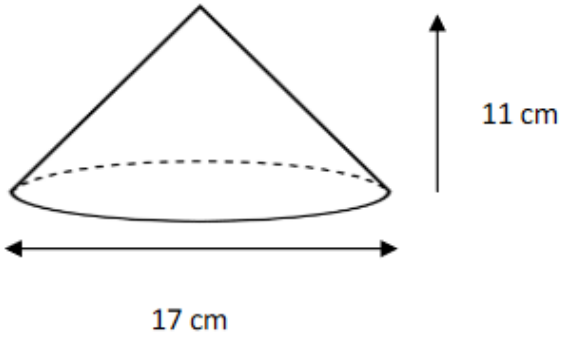
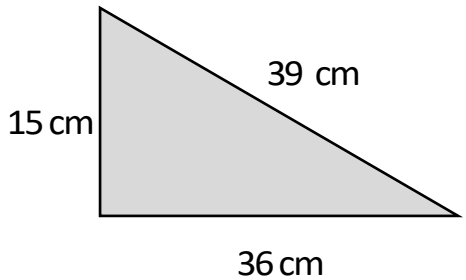
B	**S3 Nat 5 May Revision**	39
1	Write this number as a surd and evaluate $16^{0.5}$	1
2	Simplify $(3a^5)^2$	2
3	For a sector with a centre angle of $60°$ and a radius of 12 cm. Find the length of Arc AB. 	3
4	Expand and simplify $(3x-5)(x-6)$	2
5	The Area of a triangle is given by the formula $A = \frac{1}{2}bh$. Change the subject of this formula to h	2
6	The diagram below shows a cone with a diameter of 17 cm and a height of 11 cm.  Calculate the volume of this cone correct to 2 significant figures	3
7	Factorise $x^2 - x - 12$	2
8	 Use the converse of Pythagoras to determine if this is a right angled triangle	3
9	Calculate $2\frac{2}{5} \times \frac{10}{9}$	2

10	Write $x^2 - 4x + 10$ in completed square form $(x + a)^2 + b$	2
11	A straight line has the equation $y = 5x - 3$ State the value of the gradient of this line.	1
12	Solve the inequality $2 - 5x > 42$	2
13	The average value of a house in Scotland is £160 000. This average price is expected to rise by 2% each year. Calculate the average house price in 3 years.	3
14	Calculate the median and semi-interquartile range for this data set. $1 \quad 2 \quad 4 \quad 6 \quad 7 \quad 8 \quad 9 \quad 10 \quad 15$	3
15	Solve algebraically this system of equations $2x + 4y = 10$ $5x + 2y = 21$	3
16	Use factorisation to simplify $\frac{x^2+5x+14}{x^2-4}$	2
17	Write $\frac{2}{a} + \frac{3}{b}$ as a single fraction in the simplest form	2

B	Answers		
1	$16^{0.5} = \sqrt{16} = 4$	2	$(3a^5)^2 = 3a^3 \times 3a^2 = 9a^{10}$
2	Arc length $\frac{60}{360} \times \pi \times 24 =$ $12.6\ cm$	4	$3x^2 - 18x - 5x + 30 = 3x^2 - 23x + 30$
5	$2A = bh \rightarrow \quad h = \frac{2A}{b}$	6	$Volume = \frac{1}{3} \times \pi \times 8.5^2 \times 11$ $= 832.260 \ldots = 830\ cm^3$
7	$(x + 3)(x - 4)$	8	$39^2 = 1521,\ 15^2 + 36^2 = 1521,\ 1521 = 1521$ so by the Converse of Pythagoras this is a right-angled triangle
9	$\frac{12}{5} \times \frac{10}{9} = \frac{120}{45} = \frac{8}{3}$	10	$(x - 2)^2 + 6$
11	Gradient is 5	12	$-5x > 10, \qquad 5x < -40, \qquad x < -8$
13	$160000 \times 1.02^3 = £169793.28$	14	median is 7 SIQR is $\frac{9.5-3}{2} = 3.25$
15	$10x + 20y = 50$ $10x + 4y = 42$ $x = 4$ and $y = \frac{1}{2}$	16	$\frac{x^2 + 5x + 14}{x^2 - 4} = \frac{(x + 2)(x + 7)}{(x + 2)(x - 4)} = \frac{x + 7}{x - 2}$
17	$\frac{2}{a} + \frac{3}{b} = \frac{2b + 3a}{ab}$		