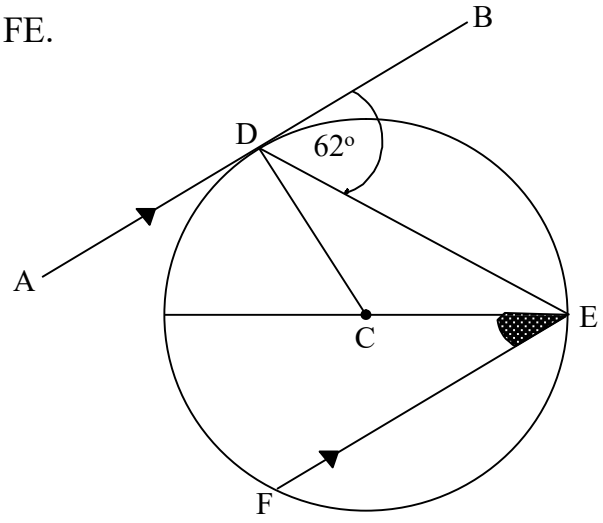
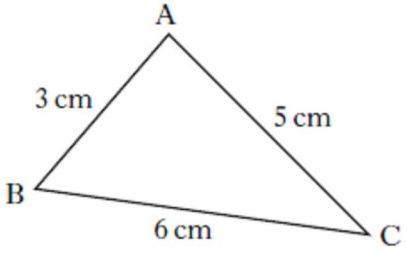
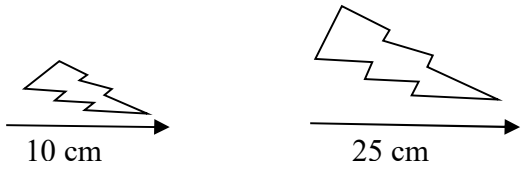
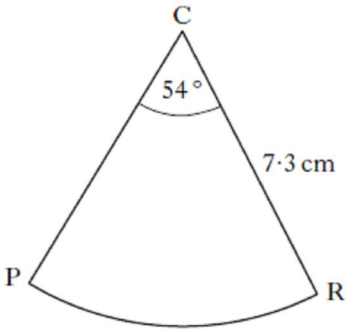
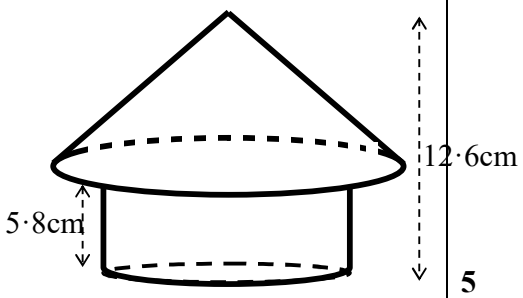
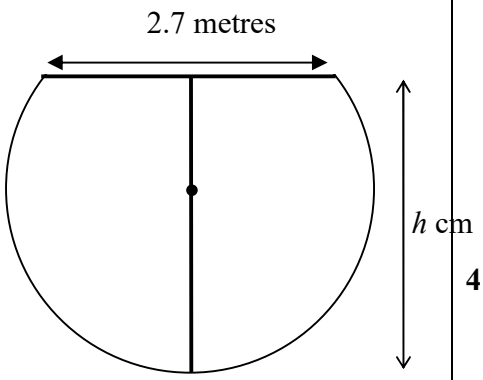
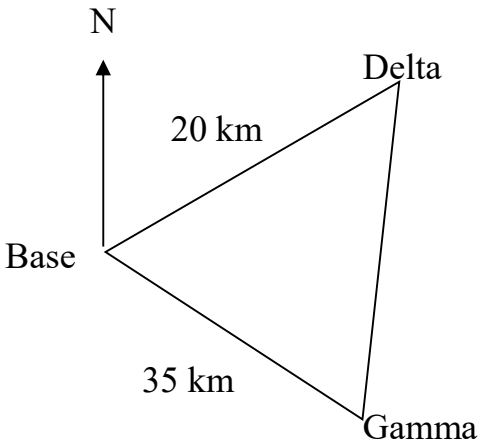
	S4 Nat 5 AB Test 2 – Non-Calculator	**20**
1.	For the function $f(x) = x^2 + 3x$, find the value of $f(-5)$	**2**
2.	Factorise $3x^2 - 5x - 2$	**2**
3.	Multiply out the brackets and collect like terms $(x - 3)(x^2 - 5x + 6)$	**3**
4.	Solve the equation $10 - 3(x + 7) < 4$	**3**
5.	The diagram shows a circle centre C. AB is a tangent to the circle with D the point of contact. FE is a chord of the circle AB is parallel to FE.  Given that $\angle BDE = \angle DEF = 62^\circ$, find the size of $\angle CEF$.	**4**
6.	In the triangle ABC show that cosB is $\frac{5}{9}$ 	**3**
7.	For straight line $3y + 4x = 12$, state the gradient and the coordinates of the x-intercept	**3**

	S4 Nat 5 AB Test 2 – Calculator	**30**
1.	It takes a minimum of 900g of melted chocolate to operate a chocolate fountain properly. On one occasion 2kg of melted chocolate was added to the fountain. Every 20 minutes 23% of the chocolate is consumed. Will there still be enough chocolate left to operate the fountain properly one hour later?	**4**
2.	The diagram below shows two shapes which are mathematically similar.  The smaller shape has a length of 10cm and an area of 135cm^2. The larger shape has a length of 25cm, calculate its area.	**3**
3.	Calculate the perimeter of the sector PCR  	**3**
4.	The diagram shows a simple model of a Crannog. The height of the model is 12·6cm. The height of the cylinder is 5·8cm. The radius of the cone is 9cm. The radius of the cylinder is 7cm.  Calculate, correct to 3 significant figures, the volume of the model.	**5**

5.	Elena works as a florist and had to make up bouquets for Mother's Day. (a) She used carnations and roses and each bouquet had to have a total of 24 flowers in it. Construct an equation in ***c*** and ***r*** to illustrate the above information. **(a)** A carnation costs 25p and a rose costs 60p. One bouquet Elena made up cost a total of £9.50. Construct a second equation in ***c*** and ***r*** to illustrate this. **(b)** How many of each type of flowers did Elena put into the bouquet?	**1** **1** **4**
6.	This shape is a circular cross section with a horizontal top. The original circle has a radius of 2.5 metres The top of the shape measures 2.7 metres Calculate the height of this shape 	**4**
7.	The oil rig Delta is 20 km away from a helicopter base on a bearing of 050° Whilst the oil rig Gamma is 35 km away from the same base on a bearing of 125° Calculate the distance between the oil rigs Delta and Gamma. 	**5**

Answers

1. $f(-5) = (-5)^2 + 3(-5) = 10$	1. 2000 x 0.77^3 = 913.066 g There will be enough chocolate left since 913·066g > 900g
2. $(3x + 1)(x – 2)$	2. Area= 135 x $\left(\frac{5}{2}\right)^2$ = 843.75cm²
3. $x^3 - 5x^2 + 6x – 3x^2 + 15x – 18$ $= x^3 - 8x^2 + 21x - 18$	3. P = 2x7.3+$\left(\frac{54}{360}\times\pi\times 14.6\right)$ = 21.5 cm
4. $10 – 3x – 21 < 4$ $-11 – 3x < 4$ $-3x < 15$ or $-15 < 3x$ $x > -5$ or $-5 < x$	4. V = $\left(\frac{1}{3}\times\pi\times 9^2\times 6.8\right)+\left(\pi\times 7^2\times 5.8\right)$ = 1469.637cm³ = 1470 cm³
5. ∠BDC = 90º ∠CDE is 28º = ∠CED as Triangle CDE is isosceles Angle CEF = 62º - 28º = 34º	5. (a) c + r = 24 (b) 25c + 60r = 950 (c) 10 roses and 14 carnations
6. Cos B = $\frac{6^2+3^2-5^2}{2\times 3\times 6}=\frac{20}{36}=\frac{5}{9}$	6. Establish a right angled triangle $2.5^2 = 1.35^2 + x^2$, x = 2.1 m Height is x + radius = 4.6 m
7. $y=-\frac{4}{3}x+4$, m = $-\frac{4}{3}$, x-intercept (3,0)	7. Angle DBG is 75º $DG^2 = 20^2 + 35^2 - 2x20x35xcos75$ = 1262.653337 DG = 35.5 km

Extra Practice

	Paper 1			Paper 2	
1.	Functions	Q1,2 Pg 105	**1.**	Percentage decrease	Q8-10 Pg 331
2.	Factorising	Q1 Pg 40	**2.**	Similar shapes	Q7-9 Pg 245
3.	Expanding brackets	Q1,2 Pg 33	**3.**	Arcs of circles	Q2,3 Pg 70
4.	Solving inequalities	Q1 Pg 117	**4.**	Volume	Q3,4 Pg 82
5.	Angle properties	Q5,7 Pg 224	**5.**	Simultaneous equations	Q1,2 Pg 129
6.	Cosine rule	Q1 Pg 303	**6.**	Perpendicular bisectors	Q1-3 Pg 231
7.	Straight lines	Q1,2 Pg 108	**7.**	Trig with bearings	Q3,4 Pg 310