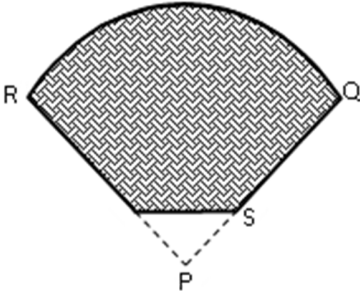
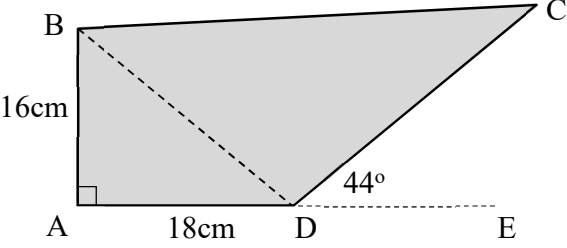


	Nat 5 Prelim 1 – Non-Calculator	<b>20</b>
1.	Multiply out the brackets and collect like terms $(x - 3)(5x + 6)$	<b>2</b>
2.	Solve algebraically the inequality $2x + 5 \leq 5x - 13$	<b>3</b>
3.	Express in simplest form $v^5 \div (v^3)^{-2}$	<b>2</b>
4.	Find the equation of the Straight line between the Points (0,10) and (24, 16)	<b>3</b>
5.	(a) Factorise $2p^2 - 7p + 3$	<b>2</b>
	(b) Hence solve the equation $2p^2 - 7p + 3 = 0$	<b>1</b>
6.	Evaluate $27^{2/3}$	<b>2</b>
7.	The diagram shows part of the graph of $y = x^2 + 6x + c$	<b>2</b>
		<b>3</b>
	(a) Find the value of $c$ .	
	(b) Hence find the coordinates of the point A.	

	Nat 5 Prelim Revision – Calculator	30
1.	<p>In 2012 the rabbit population on an island was thought to be around 4800 rabbits. The number of foxes was 64.</p> <p>It is estimated that over the next few years the rabbit population will <b>decrease</b> by 8% per year while the fox population will <b>increase</b> by 2% per year.</p> <p>Calculate:</p> <p>(a) the estimated rabbit population for 2015  (b) the estimated fox population for 2015</p>	4
2.	<p>A straight line has equation <math>y = 2x + 6</math></p> <p>A second straight line has equation <math>y = x + 3</math></p> <p>Write down the point of intersection of the two lines.</p>	4
3.	<p>A biscuit is in the shape of a sector of a circle with a triangular part removed as shown in the diagram.</p>  <p>The radius of the circle, PQ, is 7 and PS = 1.5 cm.</p> <p>Angle QPR = 80°.</p> <p>Calculate the area of the biscuit.</p>	5

4.	<p>A company gives a wage increase of 2.7%.</p> <p>Jenna's annual salary after the increase is £22500</p> <p>What was her original salary, give your answer correct to 3 significant figures</p>	<b>4</b>
5.	<p>Solve the quadratic equation <math>4x^2 - 7x - 14 = 0</math></p> <p>Give your answers <b>correct to 1 decimal place.</b></p>	<b>4</b>
6.	<p>The diagram below shows a steel plate ABCD.</p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="margin-left: 20px;"> <p><math>AB = 16 \text{ cm}, AD = 18 \text{ cm}</math></p> <p><math>\angle DAB = 90^\circ</math></p> <p><math>\angle CDE = 44^\circ</math></p> </div> </div> <p>(a) Calculate the length of BD correct to 1 decimal place. <span style="float: right;"><b>2</b></span></p> <p>(b) Show that the size of angle BDC is <math>94^\circ</math> (to the nearest degree). <span style="float: right;"><b>3</b></span></p> <p>(c) Hence calculate the length of BC given that <math>DC = 25 \text{ cm}</math> <span style="float: right;"><b>4</b></span></p>	

## Answers

Paper 1	Paper 2
1. $5x^2 + 6x - 15x - 18 = 5x^2 - 9x - 18$	1. $4800 \times 0.92^3 = 3737.7 = 3737$ rabbits $64 \times 1.02^3 = 67.9 = 67$ foxes <b>Both values round down</b>
2. $2x + 5 \leq 5x - 13$ $18 \leq 3x, \quad x \geq 6$	2. simultaneous equations equate $2x + 6 = x + 3$ , solve for $x = -3$ , substitute to find $y \quad y = -3 + 3 = 0 \quad (-3, 0)$  Eliminate $y = 2x + 6$ $\underline{y = x + 3}$ $0 = x + 3 \quad x = -3,$ $y = -3 + 3 = 0 \quad (-3, 0)$
3. $v^5 \div v^{-6} \rightarrow \frac{v^5}{v^{-6}} \rightarrow v^{11}$	3. Sector area is $\frac{80}{360} \times \pi \times 7^2 = 34.2 \text{ cm}^2$ Area of triangle = $0.5 \times 1.5 \times 1.5 \times \sin 80^\circ$ $= 1.1 \text{ cm}^2$ Area of biscuit $34.2 - 1.1 = 33.1 \text{ cm}^2$
4. $y = \frac{1}{4}x + 10$	4. $102.7\% = \text{£}22500$ $100\% = \text{£}21908.47$
5. (a) $(2p - 1)(p - 3)$ (b) $(2p - 1)(p - 3) = 0$ $p = \frac{1}{2}, p = 3$	5. $a = 4, b = -7, c = -14$ discriminant is $(-7)^2 - 4(4)(-14) = 273$ $x = \frac{-(-7) \pm \sqrt{273}}{2(4)}, x = -1.2 \text{ and } x = 2.9$
6. $\left(\sqrt[3]{27}\right)^2 \rightarrow 3^2 \rightarrow 9$	6. (a) Use Pythagoras $\sqrt{(18^2 + 16^2)} = 24.1 \text{ cm}$ (b) Sohcahtoa $\tan D = 16/18$ , angle $D = 42^\circ$ angle $BDC = 180 - (44 + 42) = 94^\circ$ (c) Cosine Rule $BC^2 = 24.1^2 + 25^2 - 2 \times 24.1 \times 25 \times \cos 94^\circ$ $BC^2 = 1289.86655 \dots \quad BC = 35.9 \text{ cm}$
7. factorized form $y = (x + 8)(x - 2)$ Expands to $y = x^2 + 6x - 16$ $c = -16$  Complete the square $x^2 + 6x - 16 = (x + 3)^2 - 25$ turning point A is $(-3, -25)$	

#### Extra Practice 4

1.	Expanding brackets	Page 32 Q2	1.	Percentage inc/dec	Page 331 Q5,6
2.	Solving inequalities	Page 116 Q2	2.	Simultaneous equations	Page 123 Q2
3.	Indices	Page 18 Q2 top of the page	3.	Reverse Percentages	Page 335 Q5,6
4.	Straight lines		4.	Sector Area and Trig Formula for Area	Page 70 Q4 Page 293 Q1
5.	Solving quadratic equations	Page 185 Q5	5.	Quadratic Formula	Page 188 Q2
6.	Evaluating Indices	Page 20 Q3	6.	Cosine Rule	Page 302 Q1
6.	Quadratic Graphs	Page 174 Q1			