



Name.....Parental Signature.....

This is a check list of the topics you need to know for National 5, in the blank column keep a track of what you need to revise and what topics you have a secure knowledge of. As the year progresses there will be some videos (on my Website-linked through school website) to help you revise and worksheets to practice topics. The most important thing is that you must revise your notes and work towards getting your best grade possible , this will only happen if you put in the effort. Supported Study is on every Tuesday 12.55 for extra support. All Past Paper Questions should be completed, there are also notes and practice questions on Scholar.

Scholar Username..... Scholar Password.....

Multiplying Brackets		
Types of brackets	$2(x+8) + 5(3x-4)$	
	$5x(4x-5)$	
	$(3x-6)(2x+7)$	
	$(4x+7)(3x^2 + 5x-3)$	
Factorising an expression		
Common Factor	$12x+18 = 6(2x+3)$	
Difference of 2 squares	$X^2-36=(x+6)(x-6)$	
Trinomial Factorisation	$X^2+7x+12= (x+3)(x+4)$	
A combination of above	$5x^2-20=5(x^2-4)=5(x+2)(x-2)$	
Completing the Square		
Writing the correct form	$x^2-4x+5= (x-2)^2+1$	
	eg Turning point (2,1)	
	Equation of axis of symmetry $x=2$	
Algebraic Fractions		
Can add/subtract/mult/divide		
Can simplify		
Straight Line and Gradient		
Find the gradient from 2 points	$m = \frac{y_2-y_1}{x_2-x_1}$	
Find the equation given a point and the gradient	$y-b=m(x-a)$	
Rearrange the equation to read off the gradient and y intercept	$3x+4y = 12$ $3y = -4x +12$ $y= -4/3 x + 4$ so $m= -4/3$, $c= 4$	
Arcs and Sectors		
Length of an Arc	Arc length= $\frac{\alpha}{360} \times \pi d$	
Area of sector	Area of sector = $\frac{\alpha}{360} \times \pi r^2$	
Working back to find angle	Given arc or area work back to get angle.	
Volume		
Volume of any prism	Volume = Area of cross section x height	

Volume of standard solids	Sphere $V = \frac{4}{3} \pi r^3$	
	Cone $V = \frac{1}{3} \pi r^2 h$	
	Pyramid $V = \frac{1}{3} \text{Area of base} \times h$	
Surds		
Simplify	$\sqrt{75} = \sqrt{25} \times \sqrt{3} = 5\sqrt{3}$	
Rationalise the denominator	Remove root from bottom of fraction	
Indices		
Multiply and divide using positive/negative and fractional powers		
$(ab)^m = a^m \times b^m$	Know rule both ways	
$a^{m/n} = \sqrt[n]{a^m}$	Roots under fractions/ underground	
Scientific notation		
Calculations using scientific notation	eg. Light travels at 3×10^8 m/s and travels for 2×10^6 seconds , how far will it travel.	
Significant Figures		
Rounding to a given number of sig figs.	Round 3245000 to 2 sig figs	
Using function notation		
$f(x) = x^2 + 4$	Evaluating functions	
If $f(x) = 3x+4$ and $f(a) = 34$, find a	Working backwards	
Equations and Inequations		
Solving equations with brackets		
Solving inequations	$3(x+5) - 6 < 12$	
Simultaneous Equations		
Construct from text	Make 2 equations given words	
Graphical solutions	Draw two lines find where they cross	
Algebraic solutions	Solve normally	
Changing the Subject		
Linear Equations	eg. $T = nst + 6y$, change to t	
Equations with a simple square or root	eg. $T = gh + 5mt^2$,change to t	
Recognising the Equation of a Quadratic Function from its graph		
Equation $y = kx^2$	Given a point find k	
Equation $y = (x+a)^2 + b$	Given Turning point write equation. TP (-4,7) equation $y = (x+4)^2 + 7$	
Sketch a quadratic function	Given $y = (4x+5)(x-3)$ or $y = (x+a)^2 + b$	
Identify the features of graph		
Positive x^2 Min ,negative x^2 Maximun	Nature-Maximum or Minimum	

Half-way between roots or from completed square	Turning point	
Equation $x = \text{number}$	Axis of symmetry	
Where graph cuts x axis $y = 0$ Factorise and solve	Roots	
Cuts y axis, when $x = 0$	Y intercept	
Quadratic Formula		
$2x^2 + 5x - 2 = 0$ solve to 2 decimal places	Use formula given $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	
Finding roots	$(x+6)(x-3) = 0$ answer is $x = -6$ and $x = 3$	
The discriminant		
Find the nature of the roots	$\text{Discriminant} = b^2 - 4ac$	
Pythagoras		
Problems including circle questions (Pythagoras Pipe)	Circle, make right angled triangle to find a length	
The converse of Pythagoras	Working back to check if angle is 90°	
Similar shapes		
Linear scale factor, k	$K = \text{shape}_2 / \text{shape}_1$	
Area factor	K^2 problems	
Volume factor	K^3 problems	
The Circle		
Tangent	A tangent meets radius at 90°	
A right angle triangle can be formed where chord is split in half		
Trig Graphs		
Basic $y = \sin x$, $y = \cos x$, $y = \tan x$	Know all the features	
Amplitude $Y = a \sin x$, a is the amplitude	Half the distance from top to bottom, $y = 5 \cos x$ amplitude is 5.	
Change of period	$Y = \sin bx$, b tells us how many cycles in 360° . Period is $360/b$	
Graph moved up/down	$Y = \cos x + 2$, $y = \sin x - 2$	
Phase angle, graph moved right or left	$Y = \sin(x + 30^\circ)$ moves 30° to left. $Y = \sin(x - 30^\circ)$ moves 30° to right.	
Trig Equations		
Solve trig Equations	$3 \sin x + 7 = 5$	
Trig Identities		
Know $\sin^2 x + \cos^2 x = 1$	use to prove a formula	
$\tan x = \sin x / \cos x$	use to prove a formula	
Work with trig relationships between 0° and 360°	Which is the greatest in value: $\sin 30^\circ \cos 90^\circ \tan 120^\circ$	

	Use graphs or cast diagram to compare which are positive, negative or zero.	
Vectors		
Add/ subtract 2D vectors using directed line segments		
Determine a 3D coordinate from a diagram		
Add/subtract vectors on component form		
Find the magnitude	$\sqrt{a^2 + b^2}$	
Trigonometry		
The sine rule	$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$	
Cosine rule	$a^2 = b^2 + c^2 - 2bc \cos A$	
Area of triangle	$A = \frac{1}{2} ab \sin c$	
Use bearings with above	To find a distance or an angle/direction	
Percentages		
Reverse %	Finding original amount before a % was added	
Appreciation	Compound interest	
Depreciation		
Fractions		
Add/subtract		
Multiply/divide		
Above with mixed numbers and BODMAS		
Statistics		
Semi - Interquartile Range	$SIMQ = (Q3-Q1)/2$	
Standard Deviation		
Line of best fit		