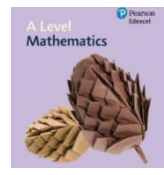
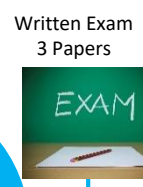




GCSE Higher B Maths Learning Journey



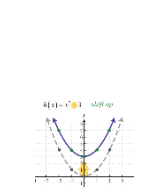
Pure Maths
 $\frac{dy}{dx} = f(x)$
 $\frac{dy}{dx} = f(x, y)$
 $z_1 \frac{\partial y}{\partial x_1} + z_2 \frac{\partial y}{\partial x_2} = y$



Exam Questions and Techniques

Congruence and Similarity

Circle Theorems
 Angles in the same segment theorem
 Angles in the same segment are equal.



YEAR 12/13

Statistics
 SHELL CURVES

Mechanics
 friction (F)
 normal reaction (R)
 If on a slope
 If on a horizontal surface

Direct and Inverse Proportion
 Direct proportion
 Inverse proportion

Sine and Cosine Rule
 This is the sine rule:
 $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$
 or
 $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$

Transforming Functions

YEAR 11

Inequalities
 $x > 3$

Quadratic Functions and Rearranging Formulae and Identities
 $y = ax^2 + bx + c$
 $y = a(x-h)^2 + k$
 $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
 $x = \frac{-b}{2a} \pm \sqrt{\left(\frac{b}{2a}\right)^2 - c}$
 $x = -\frac{b}{2a} \pm \sqrt{\left(\frac{b}{2a}\right)^2 - c}$

Geometry and Measures
 Recap and Review

Equation of a Circle
 $(x-a)^2 + (y-b)^2 = r^2$

Further Graph Sketching

YEAR 10

Statistical Measures
 Circumference & Area
 radius r
 $C = 2\pi r$
 $A = \pi r^2$

Volume
 Length
 Width
 Height

Further Equations and their Graphs
 $3x + 2y = 12$

Trigonometry Recap
 Find Angle Y
 Give your answer to 1 decimal place:
 $\sin Y = \frac{3.8}{12.4}$
 $Y = \sin^{-1}\left(\frac{3.8}{12.4}\right)$
 $Y = 17.4^\circ$

Linear and Quadratic Equations and their Graphs

Statistics Recap and Review

YEAR 9

Measures
 $\times 1000$ Km
 $\times 100$ m
 $\times 10$ cm
 $\times 1$ mm

Number Recap & Review
 $-146, -14, -685$
 $-200, 54, -22$
 $-29, 34, 77, 8, 97$
 $31, 150, -45, -1, -3$

Collecting and Representing Data

Indices
 List of Indices Laws
 $a^m \times a^n = a^{m+n}$
 $\frac{a^m}{a^n} = a^{m-n}$
 $(a^m)^n = a^{m \times n}$
 $a^0 = 1$
 $a^{-n} = \frac{1}{a^n}$
 $a^m \times a^n = a^{m+n}$
 $\frac{a^m}{a^n} = a^{m-n}$
 $(a^m)^n = a^{m \times n}$
 $a^0 = 1$
 $a^{-n} = \frac{1}{a^n}$

Sequences
 6, 10, 14, 18, 22
 $+4$
 $+4$
 $+4$
 $+4$

Measures
 Density Formula
 Density = $\frac{\text{Mass}}{\text{Volume}}$
 $\rho = \frac{m}{V}$

YEAR 8

Equations
 $2x - 3 = -7$

Pythagoras & Trigonometry
 Basic Trigonometry
 $\sin \theta = \frac{\text{Opposite}}{\text{Hypotenuse}}$
 $\cos \theta = \frac{\text{Adjacent}}{\text{Hypotenuse}}$
 $\tan \theta = \frac{\text{Opposite}}{\text{Adjacent}}$

Algebra Recap & Review
 Expanding
 $2(g + 4) = 2g + 8$

Calculating with Percentages

Indices
 Standard Form
 2.9×10^1
 3.50×10^2

Ratio and Proportion
 $20:32 \div 4 = 5:8$

YEAR 7

Basic Decimals
 Basic Algebra Review
 $6x + 2 = 2(3x + 1)$

Number Recap
 $45,000 \rightarrow 4.5 \times 10^4$
 $7.6 \times 10^{-4} \rightarrow 0.00076$

Sequences
 1 3 6 10 ...

Graphs
 Rotations
 Proportional Reasoning
 Number of bags: 6, 1, 17
 Weight (kg): 15, 2.5, 42.5

Formulae
 $V = \pi r^2 \frac{h}{3}$

Estimation
 Rounding Estimation

Angles
 Acute angle
 62°

Percentages
 Calculating Space
 a) $30\% \text{ of } 160 = \frac{30}{100} \times 160 = 160 \div 10 \times 3 = 48$

Algebraic Manipulation
 $2x + 4 - x - 3 = x + 1$

Negatives
 $-3 \times -5 = 15$

Angles
 Angles around a point add to 360°

Equations
 $x + 3 = 8$
 $x + 3 - 3 = 8 - 3$

Sequences
 19, 15, 11, 7 ...

Estimation
 $\$2.35 + \$13.85 + \$4.25$
 $\approx \$2 + \$14 + \$4 = \20

Units of Measure
 Calculating
 $4a + 5 + 2a - 3 = 6a + 2$

Constructions
 The Number System

Angles
 Right angle
 90°

Equations
 Solving Equations
 $3x + 5 = 11$
 $3x = 11 - 5$
 $3x = 6$
 $x = \frac{6}{3}$
 $x = 2$

Angles
 Angles in a straight line add to 180°

Calculating
 mean average 5
 median middle 6

Units of Measure
 Calculating
 Fraction Decimal Percentages

percentage	fraction	decimal
30%	$\frac{3}{10}$	0.3

Negative Numbers
 $-6 - 5 - 4 - 3 - 2 - 1$

Angles
 Right angle
 90°

Equations
 Y6 SATS
 Year 6 SATS

A good Mathematics GCSE at grade 5 to 7 will support your application for college and sixth form courses, apprenticeship and job opportunities. Courses in Business and Finance, and Psychology.

Simultaneous Equations
 $(1) 3x + 4y = 24$
 $(2) 4x + 3y = 22$
 $y = 12$

Statistical Measures
 Circumference & Area
 radius r
 $C = 2\pi r$
 $A = \pi r^2$

Measures
 $\times 1000$ Km
 $\times 100$ m
 $\times 10$ cm
 $\times 1$ mm

Introduction to Quadratics and Rearranging Formulae
 $x^2 + 3x - 4$

Basic Percentages
 73% of 680

Co-ordinates & Linear Graphs
 $y = 2x + 5$

Basic Number
 $-146, -14, -685$
 $-200, 54, -22$
 $-29, 34, 77, 8, 97$
 $31, 150, -45, -1, -3$

Angles
 Acute angle
 62°

Arithmetic with Fractions
 $\frac{7 \times 1}{14} + \frac{3 \times 2}{7 \times 2} = \frac{13}{14}$

Transformations
 Shape A
 Shape B

Ratio
 mean average 5
 median middle 6

Equations
 Solving Equations
 $3x + 5 = 11$
 $3x = 11 - 5$
 $3x = 6$
 $x = \frac{6}{3}$
 $x = 2$

Equations
 Solving Equations
 $3x + 5 = 11$
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