

# Key Stage 4 Mathematics 2023-2024



Pearson Edexcel 1MA1  
GCSE Mathematics  
examinations

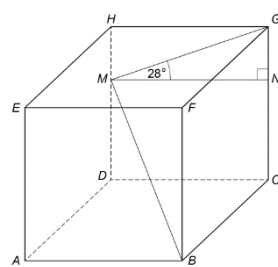
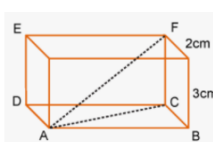


TERMS  
3 & 4  
Gap  
analysis

$$\sin^2 \theta + \cos^2 \theta = 1 \quad \tan \theta = \frac{\sin \theta}{\cos \theta}$$

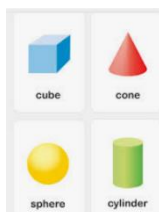
Show that  $2\cos^2 \theta \equiv 2 - 2\sin^2 \theta$

Hence, solve  $2\cos^2 \theta + 3\sin \theta = 3$  for  $0 < \theta < 180^\circ$



Volume of Sphere  
 $= \frac{4}{3}\pi r^3$

Volume of Cone  
 $= \frac{1}{3}\pi r^2 h$



PRELIMS

Ratios of angles  
and their graphs

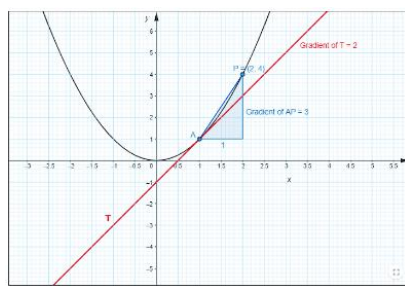
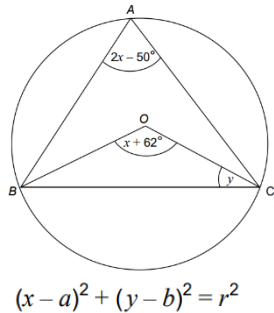
Pythagoras' theorem  
in three dimensions

Trigonometry  
in triangles

Geometric  
proof

6. Geometry  
TERMS 1 to 3

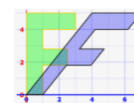
$$\begin{aligned} (a+b)^0 &= 1 \\ (a+b)^1 &= a+b \\ (a+b)^2 &= a^2 + 2ab + b^2 \\ (a+b)^3 &= a^3 + 3a^2b + 3ab^2 + b^3 \\ (a+b)^4 &= a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4 \\ (a+b)^5 &= a^5 + 5a^4b + 10a^3b^2 + 10a^2b^3 + 5ab^4 + b^5 \end{aligned}$$



$$y = ax^n$$

$$\frac{dy}{dx} = nax^{n-1}$$

Year 10  
Maths  
retrieval  
practice



$$I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

$$A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$$



Year 10  
Maths  
retrieval  
practice

PRELIMS

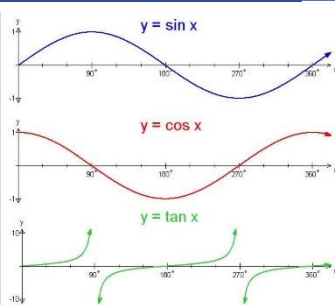
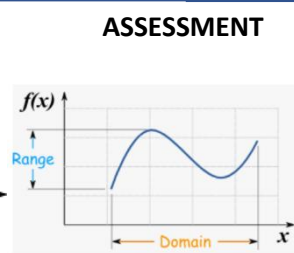
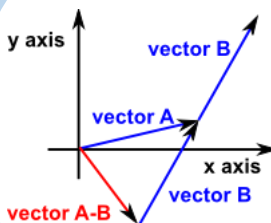
1. Number  
TERMS 1 & 2

2. Algebra  
and proof  
TERMS 1 to 3

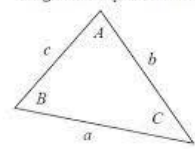
3. Coordinate geometry and the  
coordinate geometry of circles  
TERMS 1 to 3

4. Calculus  
TERMS 2 & 3

5. Matrix  
transformations  
TERMS 2 to 4



Trigonometry of the triangle



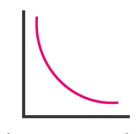
Area =  $\frac{1}{2} ab \sin C$

Sine rule:  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine rule:  $a^2 = b^2 + c^2 - 2bc \cos A$



Direct proportion



Inverse proportion

PRELIMS

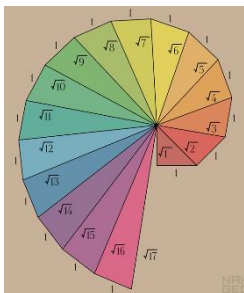
25: Vector  
geometry  
TERM 6

24: Algebraic fractions  
and functions  
TERM 5

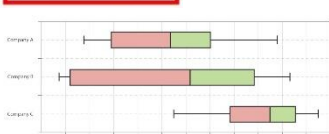
23: Graphs  
TERM 5

22: Triangles  
TERM 4

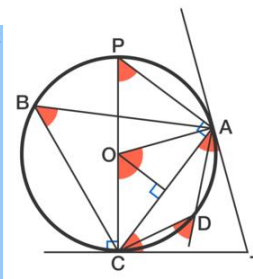
21: Variation  
TERM 4



Simplify  
 $\frac{5x}{10x^2 - 30x}$



ASSESSMENT



$$\frac{5}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{5\sqrt{3}}{3}$$

$$\frac{4}{\sqrt{5}} + \frac{11}{5 - \sqrt{3}}$$

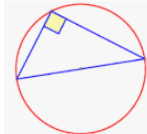
16: Counting,  
accuracy, powers  
and surds

17: Quadratic  
equations  
TERM 2

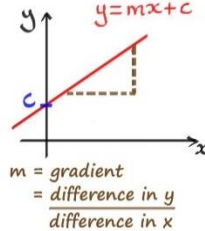
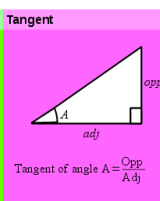
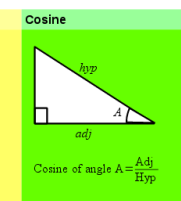
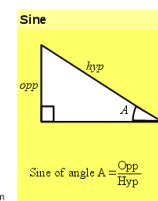
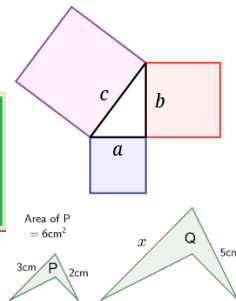
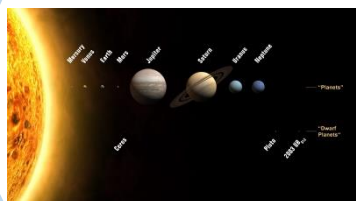
18: Sampling and more  
complex diagrams

19: Combined  
events

20: Properties  
of circles  
TERM 3



ASSESSMENT



$m = \text{gradient}$   
 $= \frac{\text{difference in } y}{\text{difference in } x}$

ASSESSMENT

15: Equations  
and inequalities

14: Powers  
and standard  
form

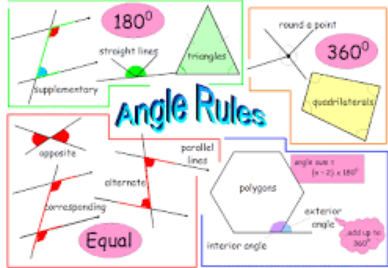
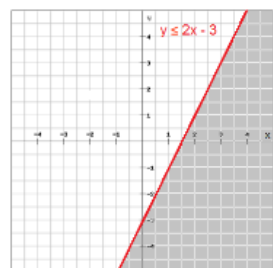
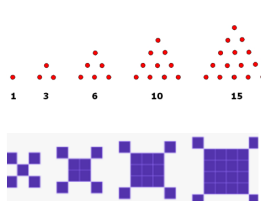
13: Exploring  
and applying  
probability

TERM 1

12: Similarity

11: Right-  
angled  
triangles

10. Linear  
Graphs



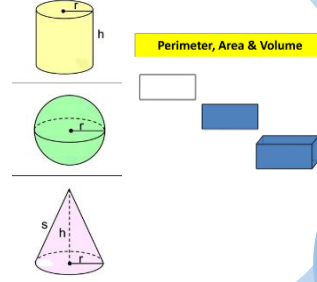
$$5x + 7 = \sqrt{2}$$

coefficient variable constant

expression expression

equation

Terms:  $5x, 7, \sqrt{2}$



Perimeter, Area & Volume

KS3 Maths  
retrieval  
practice

4: Number  
and  
sequences

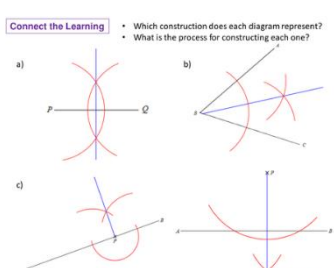
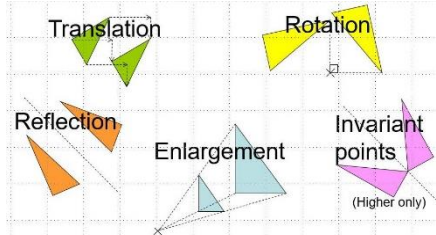
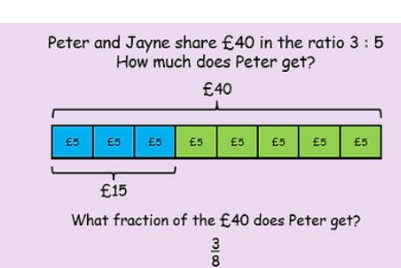
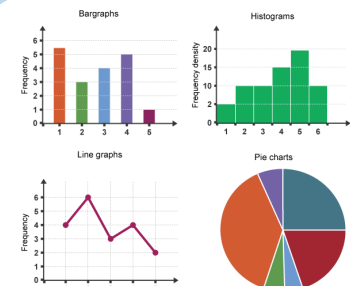
5: Ratio  
and  
proportion

6: Angles

7: Transformations,  
constructions and loci

8: Algebraic  
manipulation

9: Length, area  
and volume



KS3 Maths  
retrieval  
practice

3: Statistical  
diagrams and  
averages

2: Fractions,  
ratio and  
proportion

1: Basic  
number

AQA Level 2 Certificate  
in Further Mathematics

Collins Edexcel GCSE Maths  
Higher Student Book

START

The **range** is not an average, but tells you how the data is spread out:

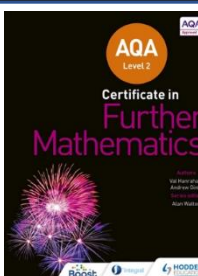
RANGE  
largest value - smallest value

MODE  
most common

MEAN  
sum of values / number of values

MEDIAN  
middle value

AO1 Use and apply standard techniques  
AO2 Reason, interpret and communicate mathematically  
AO3 Solve problems within mathematics and in other contexts



Year  
**10**