

Edexcel Modular GCSE - Foundation Unit 3

Decimals

Convert decimals to fractions and fractions to decimals

D

Formulae

Use a formula written in words, such as cost = 20 × distance travelled

Use a simple formula such as $p = 2l + 2w$

Substitute positive numbers into a simple formula

Write an expression from a problem

Substitute negative numbers into a simple formula

Use formulae from mathematics and other subjects

Substitute numbers into more complicated formulae such as

$$C = \frac{(A + 1)D}{9}$$

Find a solution to a problem by forming an equation and solving it

Rearrange linear formulae such as $p = 3q + 5$

G
 F
 F
 E
 E
 E
 D
 C
 C

Gradients

Recognise the equations of straight-line graphs such as $y = -4x + 2$

Find the gradients of straight-line graphs

C
 C

Graphs of Linear Functions

Plot the graphs of straight lines such as $x = 3$ and $y = 4$

Complete a table of values for equations such as $y = 2x + 3$ and draw the graph

Solve problems involving graphs, such as finding where the line $y = x + 2$ crosses the line $y = 1$

Find the equation of the line of best fit

E
 E
 D
 C

Index Notation

Use index notation and index laws for positive and negative powers

C

Inequalities

Solve inequalities such as $3x < 9$ and $12 \leq 3n < 20$

Solve linear inequalities such as $4x - 3 < 10$ and $4x < 2x + 7$

Represent sets of solutions on the number line

C
 C
 C

Interpreting Graphs

Plot points of a conversion graph and read off positive values

Read from a conversion graph for negative values

Interpret distance–time graphs

Calculate simple average speeds from distance–time graphs

Draw graphs of simple quadratic functions such as $y = 3x^2$ and $y = x^2 + 4$

Calculate complex average speeds from distance–time graphs

Draw graphs of harder quadratic functions such as $y = x^2 - 2x + 1$

Find the points of intersection of quadratic graphs with lines

Use graphs to find the approximate solutions of quadratic equations

F
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Linear Equations

Solve equations with one step, eg $3x = 12$ or $x + 5 = 9$

Solve equations with two steps, eg $3x - 1 = 9$

Solve equations with x on both side, eg $3x - 4 = 5 + x$

Solve equations with brackets, such as $3x - 12 = 2(x - 5)$

Solve harder equations such as $\frac{7 - 3}{x} = 2$ or $\frac{2x}{3} - \frac{x}{4} = 5$

Solve equations with negative answers

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Number Operations

Find the factors of a number

Add and subtract negative integers

Change a percentage to a fraction or a decimal and vice versa

Multiply and divide negative integers

Work out fractions of quantities such as $\frac{5}{8}$ of £20

Find one number as a fraction of another

Do calculations with simple fractions involving addition

Do calculations with simple fractions involving multiplication

Compare percentages, fractions and decimals

Use inverse operations

Understand that multiplying by $\frac{1}{6}$ is the same as dividing by 6

Do calculations with simple fractions involving subtraction

Increase or decrease a quantity by a given percentage

Write a number as a product of prime factors

Find the reciprocal of a number

Divide a number by a decimal, such as $1 \div 0.2$ and $2.8 \div 0.07$

Do calculations with mixed numbers

Do calculations with simple fractions involving division

Divide a quantity in a given ratio

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Numerical Methods

Form and solve equations such as $x^2 + x = 12$ using trial and improvement methods

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Written Methods

Work out a percentage of a given quantity

Calculate simple interest

Express one quantity as a percentage of another

Solve simple ratio and proportion problems, such as finding the ratio of teachers to students in a school

Work out answers to circle questions without a calculator, leaving them in terms of π

Work out a percentage increase or decrease

Solve ratio and proportion problems using the unitary method

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3D Shapes

Recognise the net of a simple solid such as a cuboid

Recognise and name three-dimensional (3-D) solids

Sketch three-dimensional (3-D) solids

Draw the net of a simple solid such as a cuboid

Draw a cuboid on an isometric grid and mark its dimensions

Construct and recognise the nets of 3-D solids such as pyramids and triangular prisms

Draw plans and elevations of three-dimensional (3-D) solids

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Construction

Measure a line accurately to the nearest millimetre

Measure or draw an angle accurately to the nearest degree

Draw a triangle given three sides, or two angles and a side, or two sides and the included angle

Draw a quadrilateral such as a kite or a parallelogram with given measurements

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Understand that giving the lengths of two sides and a non-included angle may not produce a unique triangle

D

Construct the perpendicular bisector of a line

C

Construct the bisector of an angle

C

Construct the perpendicular from a point to a line

C

Construct the perpendicular from a point on the line

C

Construct angles of 60° and 90°

C

Coordinates

Find the midpoint of a line segment

C

Find the length of a line AB given A and B (using Pythagoras)

C

Loci

Understand the idea of a locus

D

Construct accurate loci, such as those of points equidistant from two fixed points

C

Solve loci problems, such as identifying points less than 3 cm from a point P

C

Mensuration

Find the area of a triangle and a parallelogram

D

Calculate the circumference of a circle, given the radius or diameter, to an appropriate degree of accuracy

D

Calculate the area of a circle, given the radius or diameter, to an appropriate degree of accuracy

D

Change between area measures such as m^2 to cm^2

D

Find the perimeter of a semicircle

C

Find the area of a semicircle

C

Change between volume measures such as m^3 to cm^3 or cm^3 to litres

C

Properties of Circles

Calculate volumes of prisms and cylinders

C

Calculate surface areas of prisms and cylinders

C

Properties of Shapes

Identify isosceles, equilateral and right-angled triangles

G

Use the word 'congruent' when triangles are identical

G

Recognise and name shapes, such as isosceles triangle, parallelogram, rhombus, trapezium and hexagon

G

Show that the angles of a triangle add up to 180° and use this to find angles

E

Use angle properties of isosceles, equilateral and right-angled triangles

E

Calculate interior and exterior angles of a quadrilateral

E

Use Pythagoras' theorem to find the hypotenuse of a right-angled triangle

D

Calculate exterior and interior angles of a regular polygon

C

Use Pythagoras' theorem to find any side of a right-angled triangle

C

Use Pythagoras' theorem to find the height of an isosceles triangle

C

Use Pythagoras' theorem in practical problems

C

Understand congruence

C

Transformations

- Draw the reflection of a shape in a mirror line
- Draw a line of symmetry on a 2-D shape
- Draw *all* the lines of symmetry on a 2-D shape
- Give the order of rotations symmetry of a 2-D shape
- Name, draw or complete 2-D shapes from information about their symmetry
- Draw the line of reflection for two shapes
- Give a scale factor of an enlarged shape
- Reflect shapes in the axes of a graph
- Enlarge a shape by a positive scale factor
- Find the measurements of the dimensions of an enlarged shape
- Use map scales to find distance
- Reflect shapes in lines parallel to the axes such as $x = 2$ and $y = -1$
- Identify reflection symmetry in 3-D solids
- Describe fully reflections in a line and rotations about the origin
- Describe fully reflections in any line and rotations about any point
- Compare the area of an enlarged shape with the original shape
- Enlarge a shape by a positive scale factor from a given centre
- Translate a shape using a description such as 4 units right and 3 units down
- Reflect shapes in lines such as $y = x$ and $y = -x$
- Rotate shapes about any point
- Find the centre of a rotation and describe it fully
- Enlarge a shape by a fractional scale factor
- Compare the area of an enlarged shape with the original shape
- Translate a shape by a vector such as $\begin{pmatrix} 4 \\ -3 \end{pmatrix}$
- Transform shapes by a combination of translation, rotation and reflection

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