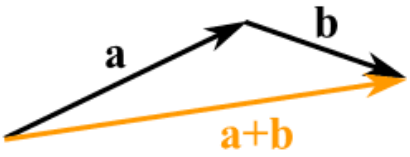
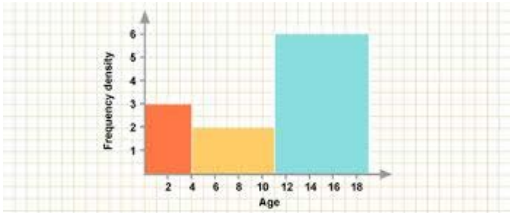
Year 11 Unit 3 Overview: Vectors, f(x), histograms and more

Target grade for tests:

You will be able to:





- **Recognise and continue geometric sequences**
- **Enlarge with a negative scale factor**
- **Use f(x) notation and understand the term "composite function"**
- **Construct equations that describe direct and inverse proportion**
- **Construct and interpret histograms**
- **Use vectors to construct geometric arguments and proofs**

Lesson Overview

GEOMETRIC PROGRESSIONS

- simultaneous equations in two variables where one is quadratic
- Recognise and use geometric progressions, ar^n, when r is a fraction > 0 or a surd
- Recognise and use non-standard sequences

ENLARGEMENTS

- Use the centre and scale factor to carry out an enlargement of a 2D shape with a negative scale factor
- Find the scale factor and centre of an enlargement with negative scale factor

FUNCTIONS

- Understand the meaning of a function
- Know the notation for composite functions
- Find the inverse of a given function
- Solve problems involving inverse functions
- Solve problems involving composite functions

DIRECT AND INVERSE PROPORTION

- Create a statement describing an identified proportional relationship (e.g. $y \propto x^2$)
- Create an initial equation describing an identified proportional relationship (e.g. $y = kx^2$)
- Use given facts to identify the value of the multiplier
- Create an equation in two variables describing an identified proportional relationship (e.g. $y = 3x^2$)
- Solve problems involving direct and inverse proportion

HISTOGRAMS

- Understand the definition of a histogram
- Construct and use the horizontal axis of a histogram correctly
- Know that frequency density = frequency ÷ class width
- Identify when it is necessary to calculate the frequency density
- Construct histograms for grouped data with equal class intervals
- Construct histograms for grouped data with unequal class intervals
- Use a histogram to find missing values in a frequency table
- Use a partially completed histogram and frequency table to complete both

VECTORS

- Understand how to create and present a proof involving vectors
- Make deductions about situations involving vectors that are multiples of other vectors
- Make deductions about situations involving vectors expressed using ratios
- Make deductions about situations involving vectors and parallel lines

Key Words
Refer to http://studymaths.co.uk/glossary.php for definitions of the key words

Term
nth term
First (second) difference
Geometric Progression
Surd

Notation
T(n) is often used to indicate the 'nth term'
r^n

Scale Factor
Similar
Transformation
Enlargement

Direct proportion
Inverse proportion
Multiplier

Notation
$\propto$ - 'proportional to'

Continuous data, Grouped data
Table, Frequency table
Frequency
Frequency density
Histogram
Scale, Graph
Axis, axes

Notation
Correct use of inequality symbols when labeling groups in a frequency table

Vector
Scalar
Constant
Magnitude
Collinear

Notation
$\underline{\boldsymbol{a}}$ *or* $\boldsymbol{a}$ (print) and $\underline{a}$ (written) notation for vectors
$\overrightarrow{AB}$ notation for vectors
Column vector notation $\begin{pmatrix} p \\ q \end{pmatrix}$, p = movement right and q = movement up