

## Y10 Unit 3 Overview-Sequences, Graphs and Probability:

Test Date:

Target grade for tests:

You will learn about:

- Sequences
- Graphs
- Probability

You will be able to:

- Recognise and use Fibonacci type sequences and quadratic sequences.
- Use the form  $y = mx + c$  to identify parallel lines, and interpret gradients and intercepts of linear functions .
- Find the equation of the line through two given points, or through one point with a given gradient.
- Interpret the gradient of a straight line graph as a rate of change.
- Recognise, sketch, plot and interpret graphs of quadratic functions, simple cubic functions and the reciprocal function  $y = 1/x$  with  $x \neq 0$ .
- Plot and interpret graphs of non-standard functions in real contexts, to find approximate solutions to problems such as simple kinematic problems involving distance, speed and acceleration.
- Calculate the probability of independent and dependent combined events, including using tree diagrams and other representations, and know the underlying assumptions.
- Enumerate sets and combinations of sets systematically, using tree diagrams.
- Understand that relative frequency (experimental probability) tends towards theoretical probability as sample size increases.

$$Y = Mx + C$$



### Lesson Overview

#### SEQUENCES

- Recognise Fibonacci numbers
- Recognise the Fibonacci sequence
- Generate Fibonacci type sequences
- Find the next three terms in any Fibonacci type sequence
- Substitute numbers into formulae including terms in  $x^2$
- Generate terms of a quadratic sequence from a written rule
- Generate terms of a quadratic sequence from its  $n$ th term
- Identify quadratic sequences
- Establish the first and second differences of a quadratic sequence
- Find the next three terms in any quadratic sequence

#### GRAPHS

- Use the form  $y = mx + c$  to identify parallel lines
- Rearrange an equation into the form  $y = mx + c$
- Find the equation of a line through one point with a given gradient
- Find the equation of a line through two given points
- Interpret the gradient of a straight line graph as a rate of change
- Plot graphs of quadratic (cubic, reciprocal) functions
- Recognise and interpret the graphs of quadratic (cubic, reciprocal) functions
- Sketch graphs of quadratic (cubic, reciprocal) functions
- Plot and interpret graphs of non-standard functions in real contexts
- Find approximate solutions to kinematic problems involving distance, speed and acceleration

### Key Words

#### Refer to

<http://studymaths.co.uk/glossary.php>  
for definitions of the key words

Term  
Term-to-term rule  
Position-to-term rule  
 $n$ th term  
Generate  
Linear  
Quadratic  
First (second) difference  
Fibonacci number  
Fibonacci sequence

#### Notation

$T(n)$  is often used to indicate the 'nth term'

Function, equation  
Linear, non-linear  
Quadratic, cubic, reciprocal  
Parabola, Asymptote  
Gradient, y-intercept, x-intercept, root  
Rate of change  
Sketch, plot  
Kinematic  
Speed, distance, time  
Acceleration, deceleration

#### Notation

$y = mx + c$

**UNDERSTANDING RISK (PROBABILITY AND LIKELIHOOD)**

- List outcomes of combined events using a tree diagram
- Label a tree diagram with probabilities
- Label a tree diagram with probabilities when events are dependent
- Know when to add two or more probabilities
- Know when to multiply two or more probabilities
- Use a tree diagram to calculate probabilities of independent combined events
- Use a tree diagram to calculate probabilities of dependent combined events
- Understand that relative frequency tends towards theoretical probability as sample size increases

Outcome, equally likely outcomes  
 Event, independent event, dependent event  
 Tree diagrams  
 Theoretical probability  
 Experimental probability  
 Random  
 Bias, unbiased, fair  
 Relative frequency  
 Enumerate  
 Set

**Notation**

P(A) for the probability of event A  
 Probabilities are expressed as fractions, decimals or percentage. They should not be expressed as ratios (which represent odds) or as words

**Suggested reading or support/ challenge available**

Support is available from a Maths teacher in 'MORALE' in M1 daily from 1:30pm -1:45pm

**Pixel Maths App**

login: PY2415  
 username: surname followed by first initial  
 password: first name

[www.hegartymaths.com](http://www.hegartymaths.com)

Go to student login at the top... find your school, enter your details and then set up your password...

[www.corbettmaths.com](http://www.corbettmaths.com)

Perfect for revision. Including practice exam questions on specific topics and the "5-a-day"

<https://vle.mathswatch.com/vle/>

login: school username followed by @penryn-college  
 password: Penryn2016

**Use your revision guide**

Use the code in the front of your guide to access your free online revision

[www.justmaths.co.uk/online](http://www.justmaths.co.uk/online)

login: PenrynStudent  
 password: Penryn

**Cross curricular**

SMSC:

- 1.1 Exploring, understanding and respecting cultural diversity e.g. exploration of different methods of calculation.
- 3.1 Developing personal qualities and using social skills (regular paired/ group work communication).
- 3.2 Participating, cooperating and resolving conflicts (paired/group activities).
- 4.2 Experiencing fascination, awe and wonder of mathematics.
- 4.4 Using imagination and creativity in learning.

literacy:

Verbal communication of understanding using key words in the correct context. Development of written communication of methods and strategies to problem solve.

NAC:

**Science** – Solve problems using intersections or gradients of graphs. Plot graphs of quadratic (cubic, reciprocal) functions. Use relative frequency to estimate probability.

**Geography** – Use relative frequency to estimate probability.

Research	
Note-making	
Group work & discussion	
Memorisation	
Precision & accuracy	
Independence	
Reflection	