

Y10 st 9.5 Unit 3 Overview-Sequences, Graphs and Probability:

Test Date:

Target grade for tests:

You will learn about:

- Sequences
- Graphs

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 $x \neq 0$.
- Recognise and use the equation of a circle with centre at the origin.
- 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.

$$Y = Mx + C$$



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

Extension

- Understand the meaning of a quadratic sequence
- Find the term in x^2 for a quadratic sequence
- Find the n th term of a sequence of the form ax^2
- Find the n th term of a sequence of the form $ax^2 + b$
- Find the n th term of a sequence of the form $ax^2 + bx + c$
- Understand the difference between an arithmetic progression, a quadratic sequence and a geometric progression
- Recognise a simple geometric progression
- Find the next three terms in a geometric progression
- Find a given term in a simple geometric progression
- Describe a geometric progression

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

Extension

- Know that perpendicular lines have gradients with a product of -1
- Identify perpendicular lines using algebraic methods

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

- 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

Extension

- Know that the area under a speed-time graph gives the distance
- Calculate (estimate) the area under a graph
- Solve problems involving the area under graphs in context

Extension

- Know the equation of a circle with centre at the origin
- Identify the equation of a circle from its graph
- Use the equation of a circle to draw its graph

Parallel
Perpendicular
Centre (of a circle)
Radius

Notation
 $y = mx + c$

Suggested reading or support/ challenge available

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

Pixl Maths App

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

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

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

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	

