Year 10 Unit 1 Overview-Number and Algebra:

Test window: 12th November 2018- 16th November 2018

Target grade for tests:

You will learn about:

- Powers, roots and positive, negative and fractional indices, Surds.
- Accuracy and rounding.
- Direct and inverse proportion.
- Algebraic manipulation.
- Sequences.

You will be able to:

- estimate powers and roots of any given positive number
- calculate with roots, and with integer and fractional indices and surds
- apply and interpret limits of accuracy, including upper and lower bounds
- interpret equations that describe direct and inverse proportion
- recognise and interpret graphs that illustrate direct and inverse proportion
- simplify and manipulate algebraic expressions involving algebraic fractions
- deduce expressions to calculate the nth term of quadratic sequences
- recognise and use simple geometric progressions

Lesson Overview	**Key Words** **Refer to http://studymaths.co.uk/glossary.php for definitions of the key words**
CALCULATING • Estimate squares and cubes of numbers up to 100 • Estimate powers of numbers up to 10 • Estimate square roots of numbers up to 150 • Estimate cube roots of numbers up to 20 • Know that $a^0 = 1$ • Know that $a^{-n} = 1/a^n$ • Know that $a^{1/n} = \sqrt[n]{a}$ • Calculate with negative powers • Calculate with fractional powers • Calculate exactly with surds • Use a scientific calculator when calculating with roots and powers • Calculate the upper and lower bounds in a given situation PROPORTIONAL REASONING • Recognise a graph that illustrates direct or inverse proportion • Interpret a graph that illustrates direct or inverse proportion • Understand that X is inversely proportional to Y is equivalent to X is proportional to 1/Y • Interpret equations that describe direct or inverse proportion • Solve problems which include finding the multiplier in a situation involving direct or inverse proportion ALGEBRAIC PROFICIENCY: TINKERING • Add (subtract, multiply, divide) algebraic fractions • Simplify an algebraic fraction • Identify when it is necessary to find two linear expressions to factorise a quadratic expression • Expand the product of two binomials involving surds • Factorise an expression involving the difference of two squares • Factorise a quadratic expression of the form $ax^2 + bx + c$	Power Root Index, Indices Standard form Inequality Truncate Round Minimum Bound Maximum Bound Interval Decimal place Significant figure Surd Limit **Notation** Inequalities: e.g. $x > 3$, $-2 < x \leq 5$ Direct proportion Inverse proportion Multiplier **Notation** $\propto$ - 'proportional to Equivalent Equation Expression Expand Linear Quadratic Algebraic Fraction Difference of two squares

• Identify when it is necessary to factorise the numerator and/or denominator in order to simplify an algebraic fraction • Simplify an algebraic fraction that involves factorisation PATTERNS AND SEQUENCES • Understand the meaning of a quadratic sequence • Find the term in x^2 for a quadratic sequence • Find the nth term of a sequence of the form ax^2 • Find the nth term of a sequence of the form $ax^2 + b$ • Find the nth 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	Binomial Factorise Term nth term Generate Quadratic First (second) difference Geometric Progression **Notation** T(n) is often used to indicate the 'nth term'

Suggested reading or support/ challenge available

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

www.doddlelearn.co.uk
See your teacher for your personal login details

Pixl Maths App
login: PY2415
username: surname followed by first initial
password: first name

Mathswatch App (video clips and worksheets)
school id: penryn
login: school username
password: octagon

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

www.justmaths.co.uk/online
login: PenrynStudent
password: Penryn

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

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 –Estimation. Round whole numbers and decimals. Order, add and subtract negative numbers. Use significant figures. Use standard form. Use formulae involving negative numbers. Use the rules of indices. Identify possible minimum and maximum values of an amount. Calculate power and roots. Use a calculator efficiently. Rearranging formulae. Compound measures,
MFL – Mental and written calculations with whole numbers and decimals.
RE - Estimation.
PE - Round whole numbers and decimals.
Geography -. Estimation. Round whole numbers and decimals.