Langdon Park School
Mathematics

Year 11H
Unit Overview

Unit 16	Circle theorems
Intention	To understand and apply circle theorems involving radii, chords, tangents, and angles, enabling accurate problem-solving and proof in circular geometry.
Key words	alternate segment. cyclic quadrilateral, subtended
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-4

Success criteria	R	A	G
I can identify and understand the properties of radii and chords in circles			
I can recognise and apply the properties of tangents to solve problems			
I can calculate angles formed by chords, radii, and tangents in circles			
I can find unknown angles involving cyclic quadrilaterals			
I can find unknown angles involving alternate segment theorem			
I can combine multiple circle theorems to solve complex geometrical problems			
I can use reasoning and proof to justify solutions involving circle theorems			

Unit sequence

1. Radii and chords
2. Tangents
3. Angles in circles 1
4. Angles in circles 2
5. Applying circle theorems

Top career

Mechanical Engineer

Works with circular shapes when designing rotating machinery, gears, engines, and other circular components.

Salary

£40,000 - £65,000+ per year

Useful links

https://www.sparxmaths.uk/
https://sites.google.com/langdonpark.org/maths
https://www.1stclassmaths.com/edexcelrevision
https://www.mathsgenie.co.uk/
https://corbettmaths.com/
https://mmerevise.co.uk/gcse-maths-revision/
https://www.thenational.academy/pupils/years/
https://www.maths4everyone.com/

YouTube channels

@ExamSolutions_Maths
@1stClassMaths
@mathsgenie7808
@corbettmaths
@mathsmadeeasy123
@TheGCSEMathsTutor
@Cognitoedu
@DrFrostMaths

Be Inclusive

Hattie Scott Peterson (1913–1993) was the first African American woman in the American Society of Civil Engineers focusing, recognised for her work in infrastructure and flood control, enhancing public safety. She broke barriers and inspired future women and minorities in engineering.

Langdon Park School
Mathematics

Year 11H
Unit Overview

Unit 17	More algebra
Intention	To develop skills in rearranging formulae, simplifying algebraic fractions, solving equations, and understanding proof, surds, and functions for advanced problem-solving.
Key words	surds, irrational, formulae, inverse, identity, root, index, exponent, functions, factorise
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-4

Success criteria	R	A	G
I can rearrange complex formulae to isolate specific variables			
I can simplify algebraic fractions by identifying and cancelling common factors			
I can add, subtract, multiply, and divide algebraic fractions accurately			
I can solve equations that involve algebraic fractions step-by-step			
I can construct mathematical proofs to verify statements			
I can work confidently with surds, simplifying and rationalising expressions			
I can interpret and apply functions in various mathematical contexts			

Unit sequence

1. Rearranging formulae
2. Algebraic fractions
3. Simplifying algebraic fractions
4. More algebraic fractions
5. Proof
6. Surds
7. Solving algebraic fraction equations
8. Functions

Top career

Actuary

Applies algebra and statistics to assess financial risk and forecast outcomes for insurance and finance industries.

Salary

£55,000 - £80,000+ per year

Useful links

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Mary Hardy (born 1958) is a renowned actuary and professor at the University of Waterloo. She is celebrated for her expertise in financial mathematics, particularly in risk management, insurance, and pensions, influencing actuarial science globally.

Langdon Park School
Mathematics

Year 11H
Unit Overview

Unit 18	**Vectors and geometric proofs**
Intention	To understand vector notation, use vector arithmetic, and solve geometric problems, including identifying parallel vectors and collinear points in various contexts.
Key words	vector, column vector, magnitude, direction, collinear, resultant
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-4

Success criteria	R	A	G
I can represent column vectors on a grid			
I can identify the magnitude and direction of a vector			
I can add and subtract vectors to find resultant vectors			
I can perform scalar multiplication to change its magnitude			
I can solve vector problems involving triangles, straight lines and ratios			
I can identify collinear points and prove that both lie on the same straight line			
I can prove with mathematical rigour that two vectors are parallel			

Unit sequence

1. Vectors and vector notation
2. Vector arithmetic
3. More vector arithmetic
4. Parallel vectors and collinear points
5. Solving geometric problems

Top career

Aerospace Engineer

Uses vectors to calculate forces, velocities, and flight paths for aircraft and spacecraft.

Salary

£45,000 - £80,000+ per year

Useful links

https://www.sparxmaths.uk/
https://sites.google.com/langdonpark.org/maths
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@DrFrostMaths

Be Inclusive

Mary Jackson (1921–2005) was NASA's first Black female engineer, who worked on aerodynamics and flight data analysis, contributing significantly to the U.S. space programme. Her story, along with those of her colleagues, was featured in the book and film *Hidden Figures.*

Langdon Park School
Mathematics

Year 11H
Unit Overview

Unit 19	Proportions and graphs
Intention	To apply concepts of direct and inverse proportion, work with exponential and non-linear functions, and perform transformations of functions.
Key words	function, exponential, magnitude, amplitude, period, intersection, root, turning point
Study	https://sites.google.com/langdonpark.org/maths/study/key-stage-4

Success criteria	R	A	G
I can calculate using direct proportion and represent these graphically			
I can identify and calculate using inverse proportions in different contexts			
I can apply exponential functions to model real-life situations			
I can interpret and plot non-linear graphs to represent different functions			
I can translate functions horizontally and vertically on a coordinate grid			
I can reflect functions across the x-axis and y-axis			
I can stretch functions on the x-axis and y-axis			

Unit sequence

1. Direct proportion
2. More direct proportion
3. Inverse proportion
4. Exponential functions
5. Non-linear graphs
6. Translating graphs of functions
7. Reflecting graphs of functions

Top career

Civil engineer

Designs, constructs, and maintains infrastructure projects, ensuring safety, functionality, and sustainability.

Salary

£70,000 - £100,000+ per year

Useful links

https://www.sparxmaths.uk/
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https://www.mathsgenie.co.uk/
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@DrFrostMaths

Be Inclusive

Dame Sharon White (born 1967) is a distinguished British businesswoman who studied Economics at Cambridge. She held significant roles, including Chief Executive of Ofcom and Chair of the John Lewis Partnership, the parent company of Waitrose.