



Learning about this topic is important because:

Ice-cream sellers typically find that they sell more ice cream the hotter the day. You can measure the strength of this correlation using the product moment correlation coefficient.

This builds on: Y12 Differentiation, Y12 Correlation, Y12 Hypothesis Testing

This leads to: Y13 Normal Distribution (continuation of exploring various Hypothesis Tests)

We will learn:

- Understand exponential models in bivariate data
- Use a change of variable to estimate coefficients in an exponential model
- Understand and calculate the product moment correlation coefficient
- Carry out a hypothesis test for zero correlation

We will develop/practise skills including:

- Use and apply standard techniques: Select and correctly carry out routine procedures; and accurately recalling facts, terminology and definitions.
- Reason, interpret and communicate mathematically: Construct rigorous mathematical arguments, make deductions and inferences, assess the validity of mathematical arguments, explaining your reasoning; and using mathematical language and notation correctly.
- Solve problems within mathematics and in other contexts: Translate problems in mathematical and non-mathematical contexts into mathematical processes, use mathematical models and interpret solutions to problems in their original context, and, where appropriate, evaluating their accuracy and limitations and explain how to refine them.

Some of the vocabulary that we will use includes:

Product moment correlation coefficient, one-tailed, two-tailed, hypothesis, null, alternative

You could learn more about this topic by:

Completing all exercises, mixed exercises, challenges and review questions from the textbook, Seeking additional support from your teachers at lunchtime drop in sessions, Searching online for the topic and GeoGebra to find relevant visual and interactive tools for understanding new concepts, using free question banks and revision tools on websites such as MathsGenie and Physics Maths Tutor.





Year 13 Mathematics - Regression, Correlation and Hypothesis Testing

Your teacher will assess your knowledge & understanding throughout the topic by looking at your work, questioning, discussion and giving you feedback in lots of different ways. The work you produce in class (your file), homework, independent study and regular assessment all form the key pieces of work in this topic.



Year 13 Mathematics – Conditional Probability



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Learning about this topic is important because:

The outcome of one event can affect the probability for another event. If a football team scores a goal, the probability that they will win the match will increase.

This builds on: Y12 Probability

This leads to: Statistics in Higher education

We will learn:

- Understand set notation in probability
- Understand conditional probability
- Solve conditional probability problems using two-way tables and Venn diagrams
- Use probability formulae to solve problems
- Solve conditional probability using tree diagrams

We will develop/practise skills including:

- Use and apply standard techniques: Select and correctly carry out routine procedures; and accurately recalling facts, terminology and definitions.
- Reason, interpret and communicate mathematically: Construct rigorous mathematical arguments, make deductions and inferences, assess the validity of mathematical arguments, explaining your reasoning; and using mathematical language and notation correctly.
- Solve problems within mathematics and in other contexts: Translate problems in mathematical and non-mathematical contexts into mathematical processes, use mathematical models and interpret solutions to problems in their original context, and, where appropriate, evaluating their accuracy and limitations and explain how to refine them.

Some of the vocabulary that we will use includes:

Set notation, intersection, union, complement, independent

You could learn more about this topic by:

Completing all exercises, mixed exercises, challenges and review questions from the textbook, Seeking additional support from your teachers at lunchtime drop in sessions, Searching online for the topic and GeoGebra to find relevant visual and interactive tools for understanding new concepts, using free question banks and revision tools on websites such as MathsGenie and Physics Maths Tutor.



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Year 13 Mathematics – The Normal Distribution

Learning about this topic is important because:

Biologists use the normal distribution to model the distributions of physical characteristics, such as height and mass, in large populations.

This builds on: Y12 Data Collection, Y12 Probability, Y12 Statistical Distributions

This leads to: Using other statistical distributions in Y13 Further Mathematics (such as the Poisson distribution) or in further education

We will learn:

- Understand the normal distribution and the characteristics of a normal distribution curve
- Find percentage points on a standard normal curve
- Calculate values on a standard normal curve
- Find unknown means and/or standard deviations for a normal distribution
- Approximate a binomial distribution using a normal distribution
- Select appropriate distributions and solve real-life problems in context
- Carry out a hypothesis test for the mean of a normal distribution

We will develop/practise skills including:

- Use and apply standard techniques: Select and correctly carry out routine procedures; and accurately recalling facts, terminology and definitions.
- Reason, interpret and communicate mathematically: Construct rigorous mathematical arguments, make deductions and inferences, assess the validity of mathematical arguments, explaining your reasoning; and using mathematical language and notation correctly.
- Solve problems within mathematics and in other contexts: Translate problems in mathematical and non-mathematical contexts into mathematical processes, use mathematical models and interpret solutions to problems in their original context, and, where appropriate, evaluating their accuracy and limitations and explain how to refine them.

Some of the vocabulary that we will use includes:

Continuous probability distribution, mean, variance, symmetrical, asymptotes, continuity correction

You could learn more about this topic by:

Completing all exercises, mixed exercises, challenges and review questions from the textbook, Seeking additional support from your teachers at lunchtime drop in sessions, Searching online for the topic and GeoGebra to find relevant visual and interactive tools for understanding new concepts, using free question banks and revision tools on websites such as MathsGenie and Physics Maths Tutor.



Year 13 Mathematics – The Normal Distribution



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Year 13 Mathematics – Moments

Learning about this topic is important because:

Moments measure the turning effect of a force. Engineers use moments to work out how much load can be applied safely to a crane.

This builds on: GCSE: Trigonometry, Y12 Forces and Motion

This leads to: Forces and Friction Y13

We will learn:

- Calculate the turning effect of a force applied to a rigid body
- Calculate the resultant moment of a set of forces acting on a rigid body
- Solve problems involving uniform rods in equilibrium
- Solve problems involving non-uniform rods
- Solve problems involving rods on the point of tilting

We will develop/practise skills including:

- Use and apply standard techniques: Select and correctly carry out routine procedures; and accurately recalling facts, terminology and definitions.
- Reason, interpret and communicate mathematically: Construct rigorous mathematical arguments, make deductions and inferences, assess the validity of mathematical arguments, explaining your reasoning; and using mathematical language and notation correctly.
- Solve problems within mathematics and in other contexts: Translate problems in mathematical and non-mathematical contexts into mathematical processes, use mathematical models and interpret solutions to problems in their original context, and, where appropriate, evaluating their accuracy and limitations and explain how to refine them.

Some of the vocabulary that we will use includes:

Moments, clockwise, anti-clockwise, resultant moment, rigid body, equilibrium, tilting, pivot, reaction

You could learn more about this topic by:

Completing all exercises, mixed exercises, challenges and review questions from the textbook, Seeking additional support from your teachers at lunchtime drop in sessions, Searching online for the topic and GeoGebra to find relevant visual and interactive tools for understanding new concepts, using free question banks and revision tools on websites such as MathsGenie and Physics Maths Tutor.





Year 13 Mathematics – Moments



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Year 13 Mathematics – Forces and Friction

Learning about this topic is important because:

A car's braking distance is determined by its speed and the frictional force between the car's wheels and the road. In wet or icy conditions, friction is reduced so the braking distance is increased.

This builds on: GCSE: Trigonometry, Y12 Forces and Motion

This leads to: Y13 Applications of Forces

We will learn:

- Resolve forces into components
- Use the triangle law to find a resultant force
- Solve problems involving smooth or rough inclined planes
- Understand friction and the coefficient of friction
- Use $F \leq \mu R$

We will develop/practise skills including:

- Use and apply standard techniques: Select and correctly carry out routine procedures; and accurately recalling facts, terminology and definitions.
- Reason, interpret and communicate mathematically: Construct rigorous mathematical arguments, make deductions and inferences, assess the validity of mathematical arguments, explaining your reasoning; and using mathematical language and notation correctly.
- Solve problems within mathematics and in other contexts: Translate problems in mathematical and non-mathematical contexts into mathematical processes, use mathematical models and interpret solutions to problems in their original context, and, where appropriate, evaluating their accuracy and limitations and explain how to refine them.

Some of the vocabulary that we will use includes:

Resolve, Magnitude, Direction, Incline, Plane, Friction, Rough, Coefficient of friction, maximum friction

You could learn more about this topic by:

Completing all exercises, mixed exercises, challenges and review questions from the textbook, Seeking additional support from your teachers at lunchtime drop in sessions, Searching online for the topic and GeoGebra to find relevant visual and interactive tools for understanding new concepts, using free question banks and revision tools on websites such as MathsGenie and Physics Maths Tutor.





Year 13 Mathematics – Forces and Friction



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Year 13 Mathematics – Projectiles

Learning about this topic is important because:

A particle moving in a vertical plane under the action of gravity is sometimes called a projectile. You can use projectile motion to model the flight of a basketball.

This builds on: GCSE: Trigonometry, Y12 Constant Acceleration, Y12 Trigonometric Identities and Equations

This leads to: Further Kinematics Y13

We will learn:

- Model motion under gravity for an object projected horizontally
- Resolve velocity into components
- Solve problems involving particles projected at an angle
- Derive the formulae for time of flight, range and greatest height, and the equation of the path of a projectile

We will develop/practise skills including:

- Use and apply standard techniques: Select and correctly carry out routine procedures; and accurately recalling facts, terminology and definitions.
- Reason, interpret and communicate mathematically: Construct rigorous mathematical arguments, make deductions and inferences, assess the validity of mathematical arguments, explaining your reasoning; and using mathematical language and notation correctly.
- Solve problems within mathematics and in other contexts: Translate problems in mathematical and non-mathematical contexts into mathematical processes, use mathematical models and interpret solutions to problems in their original context, and, where appropriate, evaluating their accuracy and limitations and explain how to refine them.

Some of the vocabulary that we will use includes:

Horizontal, Velocity, Vertical, Component, Projectile, SUVAT, time, flight, trajectory, gravity

You could learn more about this topic by:

Completing all exercises, mixed exercises, challenges and review questions from the textbook, Seeking additional support from your teachers at lunchtime drop in sessions, Searching online for the topic and GeoGebra to find relevant visual and interactive tools for understanding new concepts, using free question banks and revision tools on websites such as MathsGenie and Physics Maths Tutor.





Year 13 Mathematics – Projectiles

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Year 13 Mathematics – Applications of Forces



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Learning about this topic is important because:

A tightrope walker uses a mathematical model to calculate the tension in his wire. This allows him to make sure that the wire is strong enough to hold his weight safely.

This builds on: Y13 Moments, Y13 Forces and Friction

This leads to: Mechanics in Further Education (Engineering, Physics and Mathematics)

We will learn:

- Find an unknown force when a system is in equilibrium
- Solve statics problems involving weight, tension and pulleys
- Understand and solve problems involving limiting equilibrium
- Solve problems involving connected particles that require the resolution of forces

We will develop/practise skills including:

- Use and apply standard techniques: Select and correctly carry out routine procedures; and accurately recalling facts, terminology and definitions.
- Reason, interpret and communicate mathematically: Construct rigorous mathematical arguments, make deductions and inferences, assess the validity of mathematical arguments, explaining your reasoning; and using mathematical language and notation correctly.
- Solve problems within mathematics and in other contexts: Translate problems in mathematical and non-mathematical contexts into mathematical processes, use mathematical models and interpret solutions to problems in their original context, and, where appropriate, evaluating their accuracy and limitations and explain how to refine them.

Some of the vocabulary that we will use includes:

Particle, Rigid body, Static equilibrium, Rest, Resultant, Force, Limiting equilibrium, Stationary, Moment

You could learn more about this topic by:

Completing all exercises, mixed exercises, challenges and review questions from the textbook, Seeking additional support from your teachers at lunchtime drop in sessions, Searching online for the topic and GeoGebra to find relevant visual and interactive tools for understanding new concepts, using free question banks and revision tools on websites such as MathsGenie and Physics Maths Tutor.





Year 13 Mathematics – Applications of Forces



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Year 13 Mathematics – Further Kinematics

Learning about this topic is important because:

Vectors are used to represent motion in two and three dimensions. The surface of the ocean can be modelled as a two-dimensional plane, and velocity of a ship can be described using a vector.

This builds on: Y12 Vectors, Y12 Constant Acceleration, Y13 Differentiation, Y13 Integration

This leads to: Mechanics in Further Education (Engineering, Physics and Mathematics)

We will learn:

- Work with vectors for displacement, velocity and acceleration when using the vector equations of motion
- Use calculus with harder functions of time involving variable acceleration
- Differentiate and integrate vectors with respect to time

We will develop/practise skills including:

- Use and apply standard techniques: Select and correctly carry out routine procedures; and accurately recalling facts, terminology and definitions.
- Reason, interpret and communicate mathematically: Construct rigorous mathematical arguments, make deductions and inferences, assess the validity of mathematical arguments, explaining your reasoning; and using mathematical language and notation correctly.
- Solve problems within mathematics and in other contexts: Translate problems in mathematical and non-mathematical contexts into mathematical processes, use mathematical models and interpret solutions to problems in their original context, and, where appropriate, evaluating their accuracy and limitations and explain how to refine them.

Some of the vocabulary that we will use includes:

Particle, Vector, Position vector, velocity, Acceleration, Displacement

You could learn more about this topic by:

Completing all exercises, mixed exercises, challenges and review questions from the textbook, Seeking additional support from your teachers at lunchtime drop in sessions, Searching online for the topic and GeoGebra to find relevant visual and interactive tools for understanding new concepts, using free question banks and revision tools on websites such as MathsGenie and Physics Maths Tutor.





Year 13 Mathematics – Further Kinematics



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Grammar School

Your teacher will assess your knowledge & understanding throughout the topic by looking at your work, questioning, discussion and giving you feedback in lots of different ways. The work you produce in class (your file), homework, independent study and regular assessment all form the key pieces of work in this topic.