

Learning Plan 1

YEAR: 11 SUBJECT: Maths (Higher)
BLWYDDYN: 11 PWNC: Mathemateg (Uwch)

Knowledge focus: velocity-time graphs; length, area and volume; surds and irrational numbers



Skills, knowledge and understanding to be developed in this Learning Plan:

- Interpreting velocity-time graphs, including the use of the Trapezium rule and estimating gradients by drawing tangents
- Calculating lengths, areas or volumes when working with 2D or 3D shapes, with and without a calculator
- Converting between recurring decimals and fractions
- Manipulating and simplifying surds

Key terms to be learned in this LP:

Tangent, rate of change, gradient, Trapezium Rule, acceleration, velocity, hemisphere, frustum, sector, segment, arc, chord, recurring, rational, irrational, surd

Week/Wythnos 1-2 Learning Objectives: velocity-time graphs

- 'Tell the story' of (and draw) distance-time graphs and velocity-time graphs using the correct vocabulary
- Construct and use tangents to curves to estimate rates of change for non-linear functions
- Construct and use tangents to curves to estimate the speed/velocity from distance-time graphs, expressing results in m/s or ms^{-1}
- Construct and use tangents to curves to estimate the acceleration from velocity-time graphs, expressing results in m/s^2 or ms^{-2}
- Discover/investigate an appropriate method to estimate the area under a curve
- Apply the trapezium rule to find the distance travelled from a velocity-time graph

Objective assessments:

Be able to:

Solve problems involving velocity-time graphs

Complete GCSE style in-class assessment

Homework/Gwaith cartref:

Mathswatch

Set: 12/9/25

Due: 19/9/25

Week/Wythnos 3-4 Learning Objectives: length, area, volume

- Calculate the curved and total surface area for open and closed cylinders
- Use prior knowledge of area and circumference of circles to investigate the area, arc length and perimeter of sectors
- Calculate sector areas, sector perimeters, radii and sector angles in the context of real life problems
- Use prior knowledge of the area of a sector to investigate the curved surface area and total surface area of cones
- Calculate the curved surface area, total surface area and radius of cones in real life situations
- Calculate the volume of pyramids, spheres and hemispheres
- Solve real life problems involving volumes and surface areas, including reverse problems,
- Calculate the volume of pyramids, spheres and hemispheres

Objective assessments:

Be able to:

Solve GCSE style problems about length, area and/or volume

Solve problems about length, area and/or volume in numeracy/"real-life" contexts

Homework/Gwaith cartref:

Mathswatch

Set: 19/9/25

Due: 26/9/25

Homework/Gwaith cartref:

Mathswatch

Set: 26/9/25

Due: 3/10/25

- Solve real life problems involving volume of a frustum and finding missing dimensions of two solids with the same volume

Week/Wythnos 5-6 Learning Objectives: irrational numbers

- Use non-calculator and calculator methods to investigate recurring decimals and exact fractions
- Write fractions as recurring decimals using the correct notation
- Write a recurring decimal as a fraction in its simplest form
- Identify rational and irrational numbers
- Manipulate surds by removing perfect square factors
- Manipulate surds by adding and subtracting rational and irrational parts separately
- Simplify surds by multiplying two single term expressions written as roots
- Simplify surds by multiplying expressions involving one set of brackets and state whether answers are rational or irrational
- Solve real life problems involving roots, surds and pi
- Using π or roots in exact calculations relating to areas of circles or Pythagoras' theorem for sides of right angle triangles

Objective assessments:

- Be able to:
- Solve GCSE style problems in mathematical contexts, about surds
 - Solve problems in "real-life" contexts that involve irrational numbers

Homework/Gwaith cartref:

Mathswatch
Set: 3/10/25
Due: 10/10/25

Homework/Gwaith cartref:

Mathswatch (revision)
Set: 10/10/25
Due: 17/10/25

Week/Wythnos 7-8 Learning Objectives: mock exams:

- Revision, consolidation and assessment

Objective assessments:

- Be able to:
- Complete mock examinations

Homework/Gwaith cartref:

Mathswatch (revision)
Set: 17/10/25
Due: 24/10/25

Homework/Gwaith cartref:

Mathswatch (revision)
Set: 24/10/25
Due: 7/11/25