

Checklists Junior Cycle Higher Level

Algebra 1

Can I:

- Add and subtract like terms
- Simplify expressions
- Multiply/ remove brackets using multiplication boxes
- Evaluate expressions given values for x and y
- Solve linear equations by finding the value of x
- Solve word problems
- Do algebraic division using boxes
- Identify and define N,Z, R numbers
- Plot numbers on the number line
- Solve basic inequalities

Factors

Can I:

- Factorise expressions by taking out common factors using boxes
- Factorise by grouping terms using boxes
- Recognising the difference between 2 squares
- Factorise by using the difference between 2 squares
- Recognise quadratic expressions
- Factorise quadratic expressions using boxes
- Simplifying algebraic fractions by factorising the top and then the bottom

Sets

Can I:

- Define a set
- List the elements of a set
- Identify the universal set
- Identify the intersection of a set and use the corresponding symbol \cap
- Identify the union of a set and use the corresponding symbol \cup
- Understand subsets \subset
- Identify the complement of a set
- Identify the difference between 2 sets
- Draw venn diagrams involving 3 sets and recognise all the above
- Solve problems involving 3 sets

Applied Arithmetic

Can I:

- Calculate VAT
- Calculate profit made on an item
- Calculate the loss made on an item
- Calculate household bills
- Calculate income tax on the lower rate of tax
- Calculate income tax on the higher rate of tax
- Convert one currency to another currency
- Calculate compound interest

Statistics 1

Can I:

- List the different types of data
- Define numerical and categorical data
- Define primary & secondary data
- Describe methods of collecting data
- Design a survey/questionnaire using appropriate questions not leading questions
- Identify and define the population of a survey
- Identify & define the sample of a survey

Statistics 2

Can I:

- Define mean, mode, median
- Calculate mean, mode & median of a list of numbers
- Calculate mean, mode and median of a frequency table
- Interpret & analyse frequency tables
- Decide which average is more appropriate to use
- Define the range of a list of numbers
- Calculate the range

Statistics 3

Can I:

- Draw & interpret a line plot
- Draw & interpret a bar chart
- Draw & interpret a pie chart
- Draw & interpret a histogram
- Draw & interpret a stem and leaf diagram
- Identify misleading graphs

Area & volume

Can I:

- Define and calculate perimeter of various shapes
- Define and calculate area
- Calculate area of a parallelogram
- Calculate area of a circle
- Define and calculate circumference of a circle
- Define and calculate volume of rectangular solids
- Define and calculate area and volume of a prism

Geometry 1

Can I:

- Define, identify and draw a ray, a line and a line segment
- Define a straight-line angle
- Define a right-angle
- Identify parallel lines
- Identify corresponding angles and state their properties, F
- Identify alternate angles and state their properties, Z
- Identify vertically opposite angles and state their properties
- Recognise that a triangle has 180°
- Find missing angles in a triangle
- Identify the exterior angle of a triangle
- Recognise a parallelogram and state its properties
- Find missing angles in a parallelogram
- Understand Congruency or congruent triangles
- State the properties of congruency
- Identify why two triangles are congruent
- Label the sides of a right-angle triangle using hypotenuse, opposite & adjacent
- Write and know when to use the theorem of Pythagoras
- Define the following terms:
 - *Axiom
 - *Proof
 - *Implies
 - *Congruent
 - *Theorem
 - *Corollary
 - *Converse

Geometry 2

Can I:

- Identify similar triangles
- Find missing lengths in a triangle given a similar triangle
- Identify and use transversals to find missing lengths
- Recognise and apply circle theorems

Geometry 3

Can I:

- Apply transformations
- Define symmetry
- Identify axial symmetry
- Do my constructions

***All Theorems are below**

**** Constructions are below**

Probability

Can I:

- Define a set
- List the outcomes in a trial
- State and use the Fundamental Principle of counting
- Remember that probability is measured on a scale from 0 to 1
- Use the probability scale using words & numbers
- Calculate the probability of equally likely outcomes
- Design and use Sample spaces
- Estimate the probability from experiments
- Calculate probability using venn diagrams
- Use tree diagrams to calculate the probability of multiple events

Simultaneous equations

Can I:

- Recognise simultaneous equations
- Solve simultaneous equations
- Understand when to use simultaneous equations
- Solve problems involving simultaneous equations

Co-ordinate Geometry of the Line

Can I:

- Plot points on an XY graph
- Identify points on a graph
- Find the midpoint of two points
- Find the distance/length of a line
- Define the slope of a line
- Find the slope of a line from a graph
- Find the slope of a line given two points
- Find the equation of a line given a point and a slope
- Find the equation of a line given two points
- Given the equation of a line, find its slope and y-intercept
- Define & recognise parallel lines
- Understand that parallel lines have equal slopes
- Define and recognise perpendicular lines
- Understand that the slopes of perpendicular lines multiplied give -1
- Graph lines
- Find the intersection of two lines using simultaneous equations
- Identify the point of intersection of two lines from a graph

Ratio, Time & Speed

Can I:

- Calculate the ratio
- Calculate the length of time something takes > calculator > DMS button
- Recognise time is measured in hours
- Recognise distance is measured in kilometres
- Recognise speed is measured in kms/hour
- Apply distance = speed X time
- Apply speed = distance/time
- Apply time = distance/speed

Indices

Can I:

- Apply the rules of indices
- Solve equations involving indices
- Add, subtract & multiply surds
- Write numbers in standard form

- Write numbers using significant figures
- Find the reciprocal of a number using the calculator

Quadratic Equations

Can I:

- Recognise a quadratic equation
- Solve a quadratic equation by first finding its factors
- Use the quadratic formula (-b formula)
- Form a quadratic equation from words

Cylinder, Sphere & Cone

Can I:

- Find the volume of a cylinder
- Find the total surface area of a cylinder
- Find missing parts of a cylinder given its volume
- Find the volume of a sphere
- Find the surface area of a sphere
- Find missing parts of a sphere given its volume
- Find the volume of a hemisphere
- Find the surface area of a hemisphere
- Find missing parts of a hemisphere given its volume
- Find the volume of a cone
- Find the surface area of a cone
- Find missing parts of a cone given its volume

Patterns

Can I:

- Identify a sequence
- Identify a repeating pattern
- Identify a linear pattern and state its properties
- Find the general term (n^{th} term) of a linear sequence
- Identify a quadratic sequence and state its properties
- Find the general term (n^{th} term) of a quadratic sequence
- Graph a sequence

Functions 1

Can I:

- Define a function
- Use mapping diagrams to represent functions
- Find coefficients of functions

Functions 2 Graphing

Can I:

- The graph of a linear function
- Draw the graph of a quadratic function
- Interpret & analyse a quadratic graph
- Draw & interpret real life graphs
- Identify & interpret an exponential graph
- Draw the graph of an exponential graph

Functions 3 Real-life graphs

Can I:

- Interpret real-life graphs
- Identify directly proportional graphs and state its properties

Algebraic fractions

Can I:

- Add algebraic fractions
- Solve equations using algebraic fractions
- Solve problems involving algebraic fractions
- Do algebraic division using the array method
- Manipulate formulae

Trigonometry

Can I:

- Identify the hypotenuse, opposite and adjacent sides of a triangle
- Label a right-angled triangle using hypotenuse, opposite and adjacent sides
- state and apply the theorem of Pythagoras
- Find the sin, cos, tan of an angle
- Find the \sin^{-1} , \cos^{-1} , \tan^{-1} of an angle
- Use a calculator to find sin, cos & tan
- Solve right-angled triangles
- Solve problems using sin, cos & tan

- Draw, label & apply the triangle with 30° ○
- Draw, label & apply the triangle with 60° ○
- Draw, label & apply the triangle with 45° ○

Tips for Exam

- Write in blue or black pen only. Do not write in pencil.
- Bring calculator, one with which you are familiar.
- Do not write outside the given boxes.
- Be familiar with log tables. Know which formulae are in log tables

Calculator

- Know your calculator
- Know how to reset your calculator
- Know how to access the table function on calculator
- Know how to use the degrees & minutes button to calculate time

Theorems

1. Vertically opposite angles are equal in measure, look for X shape
2. In an isosceles triangle the angles opposite the equal sides are equal in measure. Converse is true
3. If a transversal makes equal alternate angles on two lines, then the lines are parallel
4. the angles in a triangle add to 180 degrees
5. Two lines are parallel if, and only if, for any transversal, the corresponding angles are equal
6. The exterior angle of a triangle is equal to the sum of the two interior opposite angles
9. In a parallelogram, opposite sides are equal and opposite angles are equal.
10. The diagonals of a parallelogram bisect each other.
11. If three parallel lines cut off equal segments on some transversal line, then they will cut off equal segments on any other transversal

12. Let ABC be a triangle. If a line l is parallel to BC and cuts AB in the ratio $m:n$, then it also cuts AC in the same ratio.

13. If two triangles are similar, then their sides are proportional in order

14. Pythagoras- In a right-angled triangle the square on the hypotenuse is equal to the sum of the squares on the other two sides. Converse is true.

19. The angle at the centre of a circle standing on a given arc is twice the angle at any point of the circle standing on the same arc

Constructions

1. Bisector of a given angle, using only compass & straight edge
2. Perpendicular bisector of a line segment, using compass & straight edge
4. Line perpendicular to a given line l , passing through a given point on l
5. Line parallel to a given line, through a given point
6. Division of a line segment into two or three equal segments, without measuring
8. Line segment of a given length on a given ray
9. Angle of a given number of degrees with a given ray as one arm
10. Triangle, given lengths of three sides
11. Triangle, given SAS
12. Triangle, given ASA
13. Right-angled triangle, given hypotenuse and one other side
14. Right-angled triangle, given one side and one of the acute angles
15. Rectangle, given side lengths

