

LC Ordinary Maths Checklist Paper I

Arithmetic

- I can use the **salary** chart and know that **Nett Pay = Gross – (Tax payable + USC + PRSI)**
- I can calculate **USC** given the table of % and values.
- I can **calculate** how much **VAT** will be charged at 23% given the price of an item.
- I can find the cost of an item before 23% VAT was added to it given the final price.
- I can use the **compound interest formula** to calculate interest made/charged on savings OR loans $F = P(1+i)^t$ where i is interest rate expressed as a decimal
- I can find **AER (i)** or monthly interest rate (r) for credit cards or bonds using $(1+r)^{12} = 1+i$
2nd Mock Q9 1st Mock Q8 1st Mock Q8 2nd Mock Q1 2nd Mock Q9

Number

- I can test if a number is **rational or irrational** using the **SD** button on my calculator.
- I can set my calculator to display numbers to **2 sig figures**
- I can set my calculator to display and work with numbers in **standard form/scientific notation**
- I can use the **FACT** button on my calculator to express a number as a product of its **prime factors**.
1st Mock Q2

Complex Numbers

- I can **plot** complex numbers on an Argand diagram
- I can find the **conjugate** (\bar{z}) of a complex number
- I can find the **modulus** of a complex number (distance from origin to point on Argand diagram)
- I can **divide** complex numbers.
- I can **multiply** complex numbers
2nd Mock Q2

Functions

- I can use the **Table command** on my calculator to find the **couples of a function** and can plot them
- Given a function $f(x)$, I can **find $f(7)$** algebraically and graphically by drawing a line through $x=7$ to see where it cuts the graph
- I can **solve $f(x) = 8$** algebraically and graphically by drawing line through $y=8$
- I can find the coefficients of a quadratic
2nd Mock Q6 1st Mock Q4

Calculus

- Given $f(x)$ I can find **$f'(x)$** which is the equation of the **slope of the curve** at any x point on the curve.
- I can find the slope of the curve at say $x=2$ by subbing in $x=2$ into $f'(x)$
- Given the slope of a curve at a point (x,y) , I can **find the coordinates** x by letting the slope = $f'(x)$... and first finding the x coordinate then subbing this into the $f(x)$ to find the y coordinate. This also **gives me the coordinates of the point at which the tangent** with that slope touches the curve.
- I can let $f'(x)=0$ to find the coordinates of the **local max and min turning points** of the curve by first finding a value of x and then subbing this into $f(x)$ to find the y coordinate. If I get 2 points...largest y value is the max.
- I can also decide max or min using **$f''(x) > 0$** means min turn point and **$f''(x) < 0$** means max turn point

- I know that given a formula like $s=6t-t^2$ for a moving particle that that **ds/dt =speed** of particle and **d^2s/ds^2 =acceleration** of particle and that I can sub in given values of t to find speed and acc for values of t.
1st Mock Q5 2nd Mock Q8

Patterns and Sequences

- I can find the **nth term rule** for a linear sequence and hence the terms T_1, T_2 etc
- I can find the **Sum of the first n terms** rule for a sequence
- I can find the **1st and 2nd difference** for a quadratic sequence and can find the nth term rule for the quadratic sequence by setting up and **solving simultaneous equations to find the coefficients of the quadratic**
2nd Mock Q5

Algebra

- I can **simplify algebraic fractions** using containers
- I can **solve algebraic equations with fractions** by solving the left hand side and then cross multiplying
- I can **solve and plot linear inequalities**
- I can **factorise quadratic expressions** using Highest Common Factor, Difference of 2 squares or Vinnys Way.
- I can solve quadratic equations using the **quadratic formula** and can use my calculator to do this.
- I can **solve line/quadratic equations simultaneously**. I know that the solutions would give me the coordinates of the intersection of the line and a curve in the functions questions.
- I can **solve equations involving indices**.

2nd Mock Q3 2nd Mock Q4 1st mock Q3

LC Ordinary Maths Checklist Paper II

Area and Volume

- I can identify dimensions from the given diagram and use these in the correct area and volume formulas
- I can solve problems using the **Trap Rule**

$$\text{Area} = h/2\{\text{height first} + \text{height last} + 2(\text{sum of all heights in between})\}$$

The Line

- I can find the **distance** between 2 pts and the slope of the line **m** given 2 points.
- I can find the equation of a line using **$y-y_1=m(x-x_1)$** and will give answer in form $x + y + c = 0$
- I can rewrite **$x + y + c = 0$ in form $y=mx+c$**
- Given the slope of a line, I can find **slope of line parallel** (same) and **perpendicular** (invert and change sign) to that line.
- I can find the equation of a line perpendicular to a line given a point and the slope of the other line.
- I can find if a point is **on a line**
- I can **translate points** of triangle so that one vertex is at the origin 0,0 and can then find the area of the triangle
- I can translate points by inspection

The Circle

- I can find the **eqn of a circle with centre at 0,0** given its radius and vica versa.
- I can find the **eqn of a circle with centre at h,k** given its radius and vica versa.

- I can find opposite points on a circle through **central symmetry**.
- I can find if a point is on, in or outside a circle by subbing in the co-ords into the circle equation
- I can find the **intersection of a line and a circle** by solving simultaneously
- I can find **the eqn of a tangent to a circle** given the slope of the radius perpendicular to the tangent.
- I can find eqn of the tangent to a circle using the formula in the log book.

Constructions and Enlargements

- I know how to find the **scale factor k** given an image dimension and an object dimension
- I can construct a triangle given its dimensions.
- I can find the **perp bisector of a line** and can use this skill to find the **circumcentre** and construct the **circumcircle** given 3 points..(triangle)
- I can find the **bisector of an angle** and can use this skill to find the **incentre** and construct the **incircle** given 3 points..(triangle)

Geometry

- I know how to find angles associated with **transversals and parallel lines**
- I can identify **alternate, opposite and corresponding** angles
- I can identify **isosceles triangles and know that angles opp equal sides are equal**
- I can identify **equilateral triangles** and know that **sides are equal and angles are all 60°**
- I know how to name corresponding sides of **similar triangles** and find sides accordingly
- **Ratios:** I know how find the size of lines cut off by a transversal through 3 parallel lines
- **Ratios:** I know how to find the ratio of side lengths for triangles when a line is drawn parallel to one side.
- I know how to prove that 2 triangles are **congruent** SSS,SAS, ASA, RHS

Trigonometry

- I can **use Pythagoras** to solve right angled triangles.
- I can use the **sin, cos and tan trig** ratios to solve right angled triangles.
- I know how to label triangle vertices and sides.
- I can use **the sine rule** to solve non right angles triangles
- I can use the **cosine rule** to solve non right angled triangles
- I can find the **area of a triangle using $\text{area} = \frac{1}{2} ab \sin C$ (i.e. side a and side b and the angle C in between)**

Statistics

- I can find the **mean, mode, median and standard deviation** for a set of data values
- I know how to find the mode, mean, median and standard deviation for data displayed in a Grouped Frequency Table by finding and using the **'mid-interval value'** as my values for x to 'estimate' the mean
- I can plot a **stem and leaf** diagram
- I can find the lower **quartile Q1, the upper quartile Q3 and the inter quartile range (Q3-Q1)** for a set of data values or for data presented in a stem and leaf diagram
- I can read and construct **piecharts, bar charts and histograms**
- I understand positively and negatively skewed and normal distributions
- I can read and construct **scatter graphs** and estimate **correlation coefficient r and causal relationships**.

Inferential Statistics

- Given the mean and standard deviation I can calculate the **68%, 95% and 99.7 % range values** for data as per the Empirical Rule

- Knowing n and the number of people who agreed/disagreed I can find **E the margin of error**, **\hat{p}** (the sample proportion) and the **95% confidence interval**.
- I can use the 95% confidence interval to accept or reject the **null H_0** or alternative **H_1 hypothesis**

Probability

- I can generate sample spaces for events like throwing a dice and tossing a coin
- I know how to find the '**EXPERIMENTAL PROBABILITY or RELATIVE FREQUENCY = Number of successful Trials / Total Number of Trials**'
- I know how to find the '**EXPECTED FREQUENCY**' = '**probability of the event happens**' X '**number of trials**' and know that the sum of probabilities adds up to 1.
- I know that 2 Events are '**MUTUALLY EXCLUSIVE**' if they cannot happen at the same time like picking a 'spade' and 'a red picture card' at the same time from a pack of cards. I know to apply the '**OR Rule**' / '**Addition rule**') to find the Probability of one event OR another happening. (Whether they are mutually exclusive or not) **Mutually Exclusive $P(A \text{ or } B) = P(A) + P(B)$ Not ME $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$**
- I know how fill in, complete and read the **cardinal numbers (#) for 2 and 3 topic Venn Diagrams**
- I know how to find the probabilities of events happening using **Venn Diagrams**.
- I know how to find, for two event like tossing a coin and throwing a dice, the probability of getting a HEAD and a 6 using the **MULTIPLICATION or AND Rule** which states that **$P(A \text{ and } B) = P(A) \times P(B)$**
- I know that a **Bernoulli Trial** is a random experiment with 2 possible outcomes...success and failure in which the probability of success is the same every time the experiment is conducted.
- I know how to generate a **TREE DIAGRAM** listing outcomes and associated probabilities for various trials and how to calculate the probability of all outcomes in the sample space.
- I know how to calculate '**EXPECTED VALUE**' = **Sum of (outcome or payout X it's probability)** to see note a FAIR GAME.
- I know how to calculate the number of ways tasks can be carried out using the '**Fundamental Principle of Counting**' by always considering if the outcome of the first task affects the number of outcomes in the second task. (multiply ways of task 1 x by ways of task y)