

Essentials!

Question 1 Volumes and Area

(a) (i) Must be able to find the length of an arc and the area of a segment of a circle (a) (ii) Must be able to find the area of a rectangle, cube, triangle.

(b) Must be able to use Simpsons rule in all situations. (c) Must be able to find the volume of a figure which may contain a cylinder, cone, sphere, hemisphere (formula for the hemisphere is not in the tables)

Question 2 : The Line :

(a) (i) You must know all the formulae (ii) Must be able to find the slope of the line $ax + by + c = 0$ (b) Must be able to find where a line cuts the axes. (c) Must be able to find the equation of a line perpendicular to a given line. (d) You must be able to find where two lines intersect (e) Must be able to use Symmetry and translations. (f) Must be able to find the area of a triangle, parallelogram.

Question 3: The Circle:

(a) Must be able to find the centre and radius of $x^2 + y^2 = r^2$. (b) Must be able to find the points of intersection of $ax + by + c = 0$ and $x^2 + y^2 = r^2$. (c) Must be able to find the equation of a tangent at (x_1, y_1) on $x^2 + y^2 = r^2$. (d) Must be able to find the centre and radius of $(x - a)^2 + (y - b)^2 = r^2$. (e) Must be able to find the image of this circle by a translation or a central symmetry.

Question 4 : Geometry

(a) Must know your theorems (b) Must be able to find the image of a triangle by an enlargement. I do not recommend this question.

Question 5 Trigonometry :

(a) Must know how to find the length of an arc and to find the lengths of the sides of a right angled triangle.

and be able to use these results in the expressions $\sin(A+B)$, $\cos(A+B)$ as given in page 9 of the maths tables (b) Must be able to use the Sine Rule and the Cosine Rules to solve a triangle. (c) Must be able to use your calculator to solve trigonometric equations ex If $\cos X = -0.5$ find two values of X between 0 and 360 degrees.

Question 6 Probability /Permutations /Combinations .

(a) Must know to find the number of arrangements of n things (i) all at a time (ii) r at a time . (b) Must Know how to find the number of selections of n things r at a time (nCr) . (c) Must know the rules for probability (**the and or rules**).

Question 7: Statistics :

(a) Must be able to find ,the mean and mode of a frequency table .
(b) Must be able to find a weighted mean . (c) Must be able to draw a Histogram from a frequency table where the class intervals are unequal . (d) Must be able to complete a partially completed frequency table given a Histogram .(e) Must be able to construct a cumulative frequency table ,draw an Ogive find the median and inter quartile range . (f) Must be able to answer questions on the ogive .

The Options :

Question 8 Further Geometry :

Questions based on the extra geometry theorems (only 5) best advice is to avoid this question unless you have done higher junior cert maths! .

Question 9 : Vectors :

(a)Must be able to add vectors using the triangle rule . (b) Must be able to write vectors in terms of two given vectors. (c) Must be able to deal with vectors written in terms of i and j . (the easiest option if explained well)

Question 10 : The Binomial theorem /Further Sequences and Series .

(a)Must be able to write out the Binomial expansion of $(1 + x)^n$, $(1 - x)^n$, $n \leq 7$. $n \in \mathbb{N}$. (b)Must know the formula for the sum to infinity of a GP . (c) Must be able to find the Amount of an investment when successive instalments are made .(First two bits are easy the part c can be tricky)

Question 11: Linear Programming :

(a) Must be able to sketch inequalities of the form $3x + 4y < 12$.
(b) Must be able to solve problems on Linear programming . The good news is that the problem can only involve two lines and the two axes .Easy question but tends to take a long time