

## Leaving Cert Higher Maths Paper 2

### Must Know :

#### Question 1: The Circle :

(a) You must be able to change the equation of a circle from Polar Form to Cartesian Form . (b) You must be able to find the centre and radius of given circles, (c) You must be able to find the equation of a tangent from a point to a circle , and must be able to find the equation of a tangent at a point on a circle . (d) You must know the conditions that apply when two circles touch , (although **orthogonal circles and coaxial circles are not on the course** knowledge of their properties can be useful ) Parts a and b very easy the part c,s can give trouble don't forget the geometry of the circle.

#### Question 2: Vectors :

(a) Must know how to add two vectors using the triangle /parallelogram rule . (b) Must be able to write a vector in terms of two given vectors . (c) Must be able to use the dot product to find the measure of the angles of a triangle . **this is an easy question put it on your list**

#### Question 3: The line /Transformations :

(a) Must know the two coordinate geometry proofs . (b) Must be able to use the Tan x rule for the angle between two lines . (c) You must be able to use the perpendicular distance formula \* (**remember the bisectors of angles are not on the course** . (d) You must be able to find the image of a line by a transformation . (e) You must be able to prove that the image of a specific line is parallel to the original line or if two lines are perpendicular their images are/are not perpendicular .

#### Question 4 : Trigonometry :

(a) Must be familiar with all the identities (only the first 12) on **page 9** in the tables (**10 marks**) . (b) Must be able to solve triangles using the Sine and Cosine Rules (**20 marks**)

#### Question 5 : Trigonometry:

(a) Must be able to find the area of a sector and the length of an arc . (b) You must be able to solve Trig equations of the form  $\sin X = 0$ ,  $\cos 2x + \sin x = -1$ ,  $\sin x + \sin 3x = 0$  . (c) You must be able to solve a problem which involves three dimensions (a vertical pole on a horizontal plane) and possible use of a compound angle formula ( $\sin(X + Y)$ ).

#### Question 6 : Probability /Statistics:

(a) Must be able to find the mean and standard deviation of a frequency table (b) you must be know the what happens to the mean and standard deviation when a constant is added to the data ,or the data is multiplied /divided by a constant (**properties of mean and standard deviation**) . (c) You must know all the rules for probability ie the and or rules . (d) Be careful with this question as it is difficult to get attempt marks ,to get the best value out of

this question tell the examiner exactly what you are doing at each stage so that if there are any attempt marks going you will get them .

**Question 7: Probability /Permutations and Combinations /Difference Equations :**

(a)You must be able to use the rules of permutations and combinations (note repetitions are out except in the cases of telephone numbers/ Licence plate numbers ). (b)Must be familiar with the ways of selecting committees . (c)Must be able to solve a difference equation , (d)Must be able to verify that a given  $U_n$  is a root of a given difference equation .

**The Options :**

I will only deal with question 8 the **further Calculus Option** .

(a)You must be able to integrate by parts ,(b)You must be able to integrate by parts a function which involves at most two steps(  $e^x \sin x, x^2 \ln x$  ). (c)You must be able to find the max or min of a given object ,remember the method (i)find the equation of the problem ,(ii)reduce the equation to an equation in one variable .(iii)find  $dy/dx$  and set equal to zero, and solve for  $x$  . (iv)differentiate again to establish max/min .(v)use the value found to find the max/min .(d)You must be able to use the Maclaurin expansion to write a given function as a power series.The following are the required functions  $\sqrt{1+x}, e^x, \ln(1+x), \cos x, \sin x, \tan^{-1} x$  . You must also be able to find

**$\Pi$  using the sum of two inverse tans** ..(e)You must be able to use the ratio test to establish if a series converges or diverges the  $U_n$  of this series can only be of the form  $\sum A_n x^n$  .

**Be careful with this question marks lost in this question cannot be replaced by doing another question !**