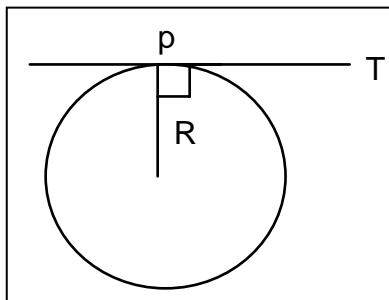


Must Know :

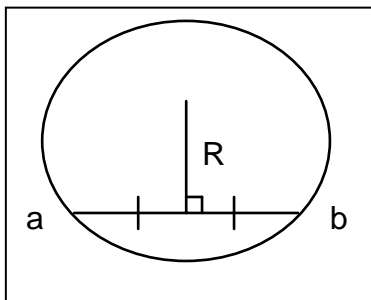
Question 1: The Circle :

(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.

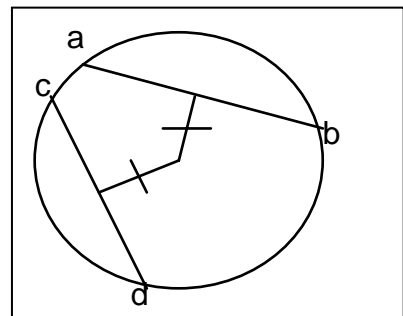
Geometry of the circle ;



The radius is perpendicular to a tangent at the point of contact



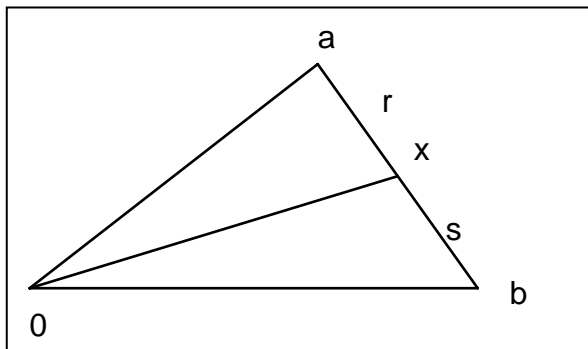
A diameter perpendicular to a chord bisects the chord



Chords of the same length are equidistant from the centre of a circle

Question 2: Vectors :

(a) Must know how to add two vectors using the triangle /parallelogram rule .(Question 2a 2005 was so badly done that they changed the marking scheme!) (b) Must be able to write a vector in terms of two given vectors a very useful formula can be used in situations where x is on ab.



$$x = \frac{sa + rb}{r + s}$$

(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 .Remember you can use vectors to derive the Cosine rule and the perpendicular distance formula.**

Question 3: The line /Transformations :

(a) Must know the two coordinate geometry proofs .

(i)The perpendicular distance formula $\left| \frac{ax_1 + by_1 + c}{\sqrt{a^2 + b^2}} \right|$

(ii)The angle between two lines formula $Tan \theta = \pm \frac{m_1 - m_2}{1 + m_1 m_2}$

(b)Must be able to use the Tan θ 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 and area of a triangle(**20 marks**).Three dimensional diagrams have been popular with the examiners recently.Remember these are only variations on questions based on a right angled triangle.

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).Problems involving compound angles,($\sin(X + Y), \cos(x \pm y)$) are very likely.

Question 6 :Probability /Statistics:

(a)Must be able to find the mean and standard deviation of a frequency table (b)You must 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**) .The following formula is a quick

way of finding the Standard Deviation $\sigma = \sqrt{\frac{\sum fx^2}{\sum f} - \left(\frac{\sum f}{\sum f}\right)^2}$ The mean of the squares – square of the mean

(c)You must know all the rules for probability ie the **and or** rules .

(i)The probability that you will get the answer you want to a particular question is

Number of right answers

Total number of answers

Probability of A and B = P (A) x P (B)

Probability of A or B = P (A) + P (B)

(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 Un 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($e^x \text{Sin}x, x^2 \text{ln} x$). (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 and to find the general term of this series.The following are the required functions $\sqrt{1+x}, e^x, \text{ln}(1+x), \text{Cos} x, \text{Sin} x, \text{Tan} x, \text{tan}^{-1} x$. You must also be able to find π **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 Un 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** !2005.

Be careful how you choose your questions the **line and the Circle** were very difficult in 2003,2004,

Leaving Higher Level maths solutions 1996-2005 available on Line or from Easons

Order online @www.leavingcert.ie

