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மேல் மாகாணக் கல்வித் திணைக்களம்
Department of Education - Western Province

වර්ෂ අවසාන ඇගයීම
ஆண்டிறுதி மதிப்பீடு - 2014
Year End Evaluation

ශ්‍රේණිය தரம் Grade	විෂයය பாடம் Subject	පත්‍රය வினாத்தாள் Paper	කාලය காலம் Time
11	Mathematics	I	02 Hours

Name / Index No : .....

.....
Signature of invigilator

Important :

- This paper consist of 8 pages.
- Write your **index number** correctly in the appropriate place on **page one** and **page three.**
- Answer all questions **on this paper itself.**
- Use the space provided under each question for working and writing the answer.
- It is necessary to write relevant steps and correct units.
- Marks will be awarded as follows:
  one mark each for questions 1 - 10 and
  two marks each for questions 11 - 30 in part A
  10 marks each for questions in part B

For marking examinor's use only

Question number		Marks
A	1 - 10	
	11 - 30	
B	1	
	2	
	3	
	4	
	5	
Total		

.....
Marked by

Part A

Answer **all questions** on this paper it self.

(01) Simplify. $\frac{1}{3} \times \frac{1}{2}$

(02) Express $6 : 9$ in the simplest form.

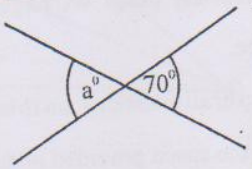
(03) Find the value of x , if $\frac{x}{5} = 1$

(04) A note of Rs 100 was given to buy a book worth Rs 78. Find the balance.

(05) Express the length 205 cm in metres.

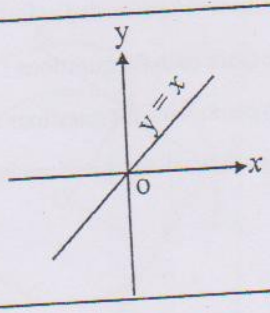
(06) A die numbered 1 to 6 was tossed once. Find the probability of getting a number greater than 5.

(07) Find the value of a.



(08) Find the number represented by the tally marks. 𝍸 ||

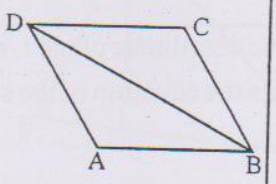
(09) Shade the region $y \leqslant x$



(10) Write the value of 1 - 0.01

(11) Express $1\,0\,1\,0\,1_{two}$ as a number to the base 10.

(12) In the rhombus ABCD, $D\hat{B}C = 25^0$. Write the values of the angles given below.



(i) $D\hat{B}A$

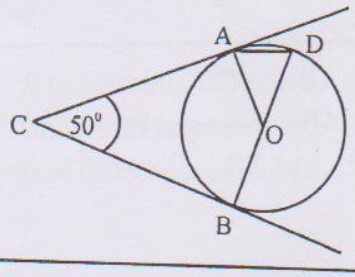
(ii) $D\hat{A}B$

(13) Find the value of $lg\,5 + lg\,2 - 1$

(14) If $A = \begin{pmatrix} 2 & -1 \\ -1 & 0 \end{pmatrix}$ and $A + 2B = \begin{pmatrix} 2 & 1 \\ 5 & 2 \end{pmatrix}$, write the matrix B with elements.

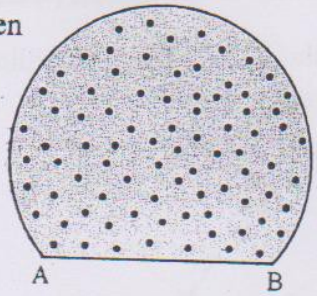
(15) A provincial administrative institute which imposes an assessment tax of 8%, assessed the annual value of a certain house as Rs 250 000. Find the amount of tax to be paid for a quarter.

(16) CA and CB are two tangents drawn to the circle with centre O.BD is a diameter. If $A\hat{C}B = 50^0$, find the value of $A\hat{D}B$.



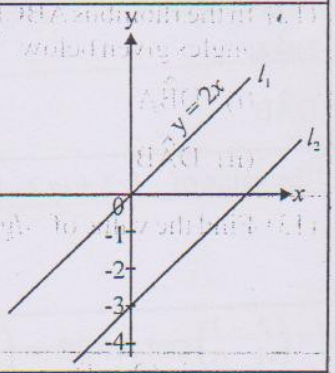
(17) An amount of work which can be done by 4 women in one day, can be completed in a day by 3 men. How many men needed to complete an amount of work in three days, which can be done by 6 women in two days.

(18) A thin metal lamina in the shape of a circular segment is given in the figure. It is needed to cut a triangle whose base is AB and with maximum area of the lamina. Draw a rough diagram of the construction lines to do it, using knowledge of loci and constructions.



(19) Make r the subject. $p(r-s)=2r$.

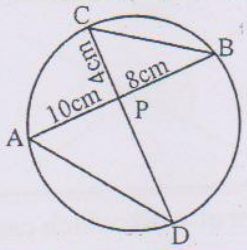
(20) In the coordinate plane l_1 and l_2 are two parallel straight lines.
Write the equation of the straight line l_2.



(21) If $3.25 \times 624 = 2028$, find the value of $\frac{202.8}{3.25}$

(22) Nimal who came out a fruit stall, said that he has spent Rs 100 or more than it, to buy 8 bananas each cost Rs 5 and 3 mangoes each cost x rupees. Write an inequality and find the minimum cost of a mango.

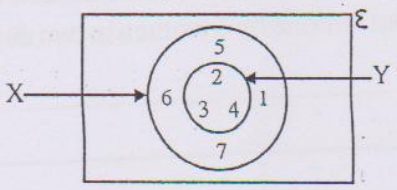
(23) The chords AB and CD intersects at P.
CP = 4cm, AP = 10cm and PB = 8cm.
Find the length of PD.



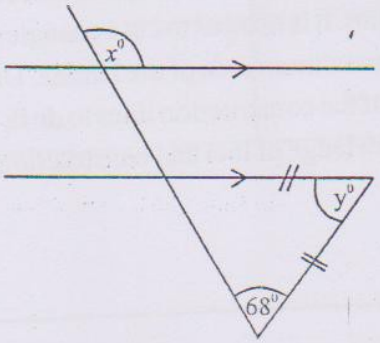
(24) The two sets X and Y are represented in the figure.
Fill in the blanks using suitable symbols.

(i) Y X

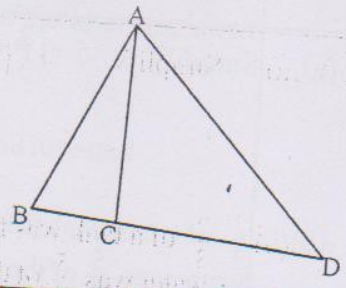
(ii) X ..... Y = {2, 3, 4}



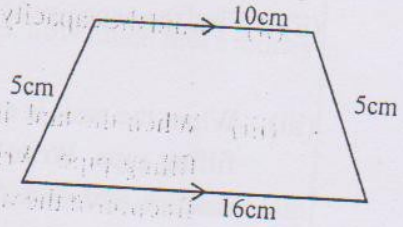
(25) Find the values of x and y, according to the data given in the figure.



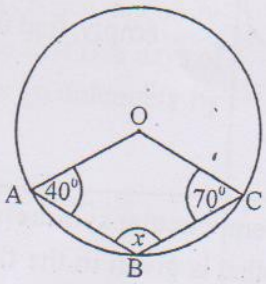
(26) In the triangle ABD, BC : CD = 1 : 2. The area of the triangle ABC is 16cm². Find the area of the triangle ACD.



(27) According to the data given in the figure, find the perpendicular distance between parallel lines in the trapezium.

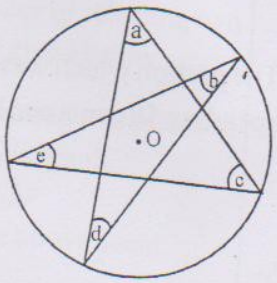


(28) A, B and C are three points on the circle whose center is O. If $O\hat{A}B = 40^0$, $B\hat{C}O = 70^0$, find the value of x.



(29) Find the value of $\sqrt{38 \times 28 + 25}$, using the factors of difference of two squares.

(30) a, b, c, d and e are five angles subtended on the circle with center O. Find the value of $a + b + c + d + e$



Part - B

Answer all questions on this paper if self.

(01) (a) Simplify. $5 \div \left(\frac{2}{3} + \frac{1}{6}\right)$

(b) $\frac{2}{3}$ of a tank was filled with water. After using 250l from it, remaining amount of water was $\frac{5}{9}$ of the tank.

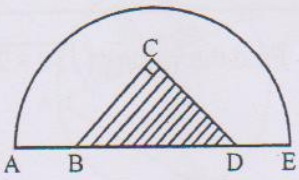
(i) Write the volume of water consumed as a fraction of the whole tank.

(ii) Find the capacity of the tank.

(iii) When the tank is empty, it takes 10 minutes to fill the above tank, by the filling pipe. Write the volume of water can be filled in one minute, as a fraction of the whole tank.

(iv) The tank which is completely filled with water empties by another pipe in 30 minutes. If both of the above pipes are opened at once, when the tank is empty, find the time taken to fill the tank.

(02) A semi circular **symmetrical** carpet with the diameter 112 cm which is prepared using cloths, is given in the figure. The shaded right angled triangular portion is prepared using a thick striped cloth and the area of it is 2450cm^2.



(i) What is the radius of this carpet?

(ii) Find the area of the floor covered by the carpet.

(iii) It is needed to attach a thin ribbon along BC and CD of shaded portion. Find the length of the ribbon needed.

(iv) Since the striped portion of the carpet got damaged, a semi circular piece of cloth was attached to cover it slightly. Draw a rough sketch of it on the above figure. Show that the radius of that semi - circle is $35\sqrt{2}$ cm.

(v) The portion which was not covered by the semi circle in above (iv) was coloured by spending 50 cents per 1cm^2. Find the amount of money spent.

(03) Sunil, Nimal and Wimal started a business by investing money to the ratio 2 : 3 : 3

(i) Write the amount of money invested by Sunil, as a fraction of the total amount of money invested.

(ii) Find the total amount of money invested for the business, If sunil invested Rs 25000.

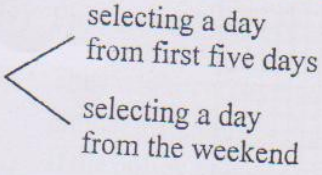
(iii) The ratio between the total money invested in the business and the profit gained at the end of the year was 4 : 3. Find the profit.

(iv) If the profit was divided according to the money invested, how much more money will be received by Nimal than Sunil.

(v) Wimal says that, if he deposited the above invested amount in a bank, he can obtain an annual simple interest of 10%. How much more profitable is investing money in the business than depositing in the bank.

(04) (a) In a certain week, Nimal hopes to go to Badulla on a day which is chosen randomly. He expects to go by train or by his private vehicle if he go on the first five days of the week. If he has to go on a day in the week end, he expect to go defenitely by train.

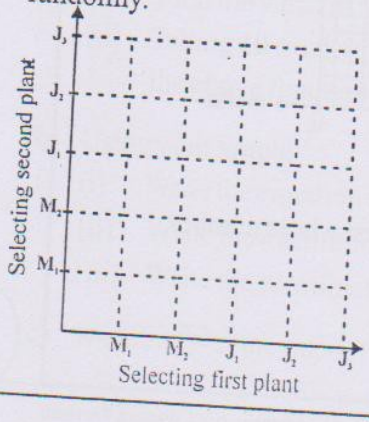
(i) Write the probabilities on the tree diagram about the journey to Badulla.



(ii) If the probability of selecting his private vehicle for the journey is $\frac{2}{5}$, extend the tree diagram and write the relevant probabilities.

(iii) Find the probability of Nimal travelling by **train**, on a day of the first five days or on a day in the week end.

(b) Kamala hopes to plant two plants on her birthday. She was given two Mango plants (M_1, M_2) and three jack plants (J_1, J_2, J_3). She hopes to select and plant two plants randomly.



(i) Represent the sample space of selecting two plants on the square grid given below.

(ii) Represent the event "selecting two plants in the same type" on the above graph.

(iii) Find the probability of the above event.

(05) At a certain school marks obtained by 40 student in grade 11, for a mathematics assessment test are in the stem and leaf diagram given below.

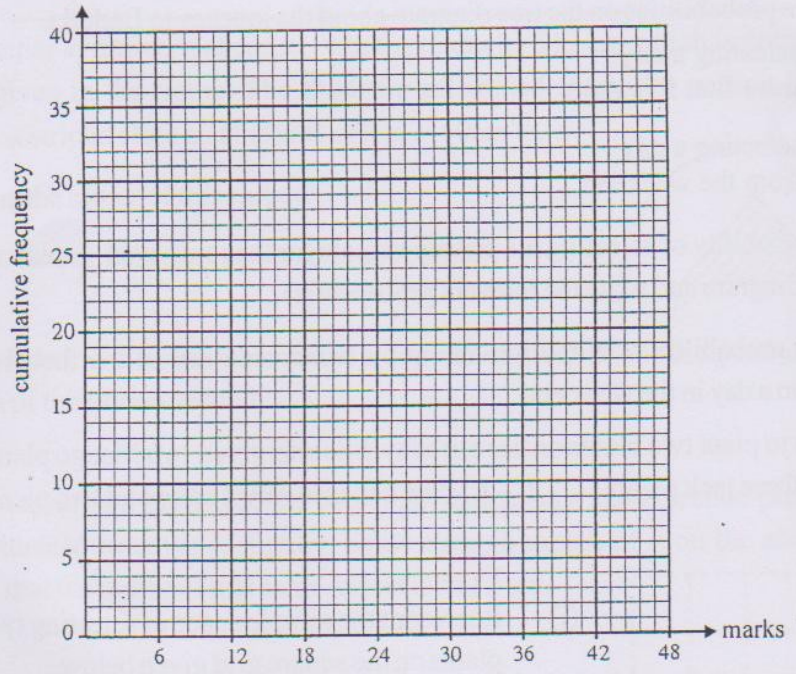
Stem	Leaf
0	8, 9
1	1, 1, 2, 3, 4, 5, 6, 7, 8, 8, 9
2	0, 0, 1, 2, 2, 3, 3, 4, 4, 5, 5, 6, 7, 8, 8, 9, 9, 9
3	0, 0, 0, 1, 2, 2, 4, 5
4	1

(i) According to the above data, what is the highest mark obtained by a student.

(ii) Complete the table given below using the data in the stem and leaf diagram.
(The class interval 6 - 12 means marks greater than 6 but less than or equal to 12)

Class interval (Marks)	Frequency (Number of student)	Cumulative frequency
6 - 12	.....	.....
12 - 18	.....	.....
18 - 24	.....	.....
24 - 30	.....	.....
30 - 36	.....	.....
36 - 42	.....	.....

(iii) Draw the cumulative frequency curve on the coordinate plane using the above frequency table.



According to the cumulative curve;

(iv) find the median mark obtained by a student to the nearest whole number.

(v) find the interquartile range.

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ශ්‍රේණිය தரம் Grade	11	විෂයය பாடம் Subject	Mathematics	පත්‍රය வினாத்தாள் Paper	II	කාලය காலம் Time	02 1/2 Hours

* Answer **10 questions** , selecting **five questions** from **part A** and **five questions** from **part B**
* Each question carries 10 marks.
* The volume of a solid sphere of radius r is $\frac{4}{3}\pi r^3$,
  The volume of a right circular cone with radius of the base r and height h; is $\frac{1}{3}\pi r^2 h$.

Part A

Answer **five** questions only.

(01) (a) At a certain company, Nimal owns number of shares with the nominal value Rs 6000. This company pays a dividend of 7% annualy and the nominal value of a share is Rs 10.

(i) Find the number of shares Nimal has.

(ii) What is the annual income received by him.

Nimal sold his shares and bought Rs 25 shares at Rs 24 per share from a company which pays an annual dividend of 6%. The income he obtained from this company increased by Rs 105, than from the earlier company.

(iii) If the amount of money invested in the second company is x rupees , find the value of x.

(iv) Find the selling price of a share of the company which pays a dividend of 7%.

(b) (i) The instalment to be paid for every Rs 1000 to insure a vehicle is Rs 60. Find the annual instalment to be paid for a motor car worth Rs 1600 000.

(ii) If the policy holder agrees to forego Rs 15 000 at every claim, instalment will be decreased by 15%. Hence, find the amount to be paid as an instalment.

(02) An incomplete table prepared to draw the graph of the function $y = 3 - (x+2)^2$ is given below.

x	-5	-4	-3	-2	-1	0	1
y	-6	-1	2	....	2	-1	-6

(a) (i) Find the value of y when $x = -2$

(ii) Taking 10 small divisions as one unit along both x and y axes , draw the graph of the above function.

(b) Using your graph;

(i) Write the equation of axis of symmetry.

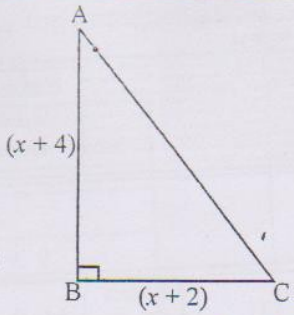
(ii) Write the maximum value of the function, $y = -x^2 - 4x - 1$

(iii) Write the coordinates of the turning point of the function $y = x^2 + 4x + 1$

(c) When $x = \sqrt{3} - 2$, the value of the function $y=3-(x+2)^2$ is zero. Hence deduce the value of $\sqrt{3}$.

(03) (a) Solve. $\frac{1}{2(x-1)} + \frac{1}{(x-1)} = \frac{3}{4}$

(b) In the given right angled triangle length of AB is $(x+4)$ centimeters and length of BC is $(x+2)$ centimeters.



(i) Write an expression for the area of the triangle ABC, interms of x.

(ii) If the area of this triangle is $9.5cm^2$, show that the value of x satisfies the equation $x^2 + 6x - 11 = 0$

(iii) By completing square or any other method, solve the above equation and find the length AB. (take $\sqrt{5} = 2.24$)

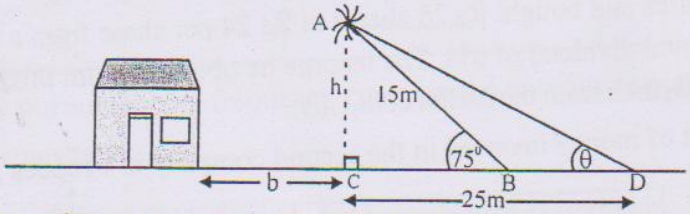
(04) (a) A child at the point A on a horizontal ground, observes the flag post F with a bearing of 070^0. He walks 20m to the East and reaches point B. Now he observes the flag post with a bearing of 290^0.

(i) Draw a rough diagram to represent above data.

(ii) If AB is represented by 5cm in a scale diagram find the scale.

(iii) If the child observes the flag post from C after walking 10m to the East from A, find the bearing of the flag post.

(b) A coconut tree AB is inclined towards a house as given the figure. Top of the tree has been binded by a wire to the point D on the ground firmly, to avoid falling down. The length of AB is 15m and the length of CD is 25m. AD represents the length of the wire. (Ignore the parts of the coconut tree above the point A)



According to the measurements given in the figure using trigonometric ratios,

(i) Calculate the height h.

(ii) If the wire is inclined θ^0 to the horizontal ground, find the value of θ.

(iii) Show that b must satisfy the inequality $b > 15(1 - \cos 75^0)$ to prevent the house from damage, if the tree fell down.

(05) (a) Rs. 100 is needed to buy 5 pencils and 4 pens. The price of a pen is one less than twice the cost of a pencil.

(i) Construct a pair of simultaneous equations of x and y, if the price of a pencil is x rupees and price of a pen is y rupees.

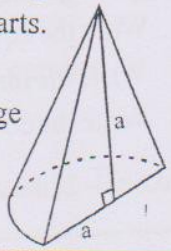
(ii) Find the prices of a pen and a pencil separately by solving the above equations.

(iii) Number of pencils that can be bought for a certain amount of money is 7 greater than the number of pens that can be bought for the same amount of money. Find that amount of money.

(b) Factorise. $mt - nt - m + n$

(06) (a) Simplify using logarithmic tables. $\frac{86.7 \times (0.345)^2}{\sqrt{6.785}}$

(b) The semi circular cone given in the figure, is obtained by separating a right circular solid metal cone with the radius "a" and the height "a" into two equal parts.



(i) Find the volume of this solid object in terms of a and π.

(ii) A metal sphere is prepared by melting this solid without any wastage of metal. Show that the radius of the sphere is equal to the half of the height of the cone.

Part - B

Answer only five questions.

(07) (a) The annual salary of a saleswoman who is recruited to a certain shop is Rs 60000. The annual salary is increased by Rs 1200 in each year, for a period of 10 years.

(i) What progression do the annual salaries of the first 3 years follow, when written in order.

(ii) What will be the annual salary received by the sales woman in the 10^{th} year?

(iii) Find the total amount of money she receives at the end of 10 years.

After completing 10 years the annual salary for the next years is equal to the annual salary of the 10^{th} year. A promotion will be given after completing 15 years of service.

(iv) The owner of the shop says that, he has paid more than a million of rupees for a saleswoman who obtains a promotion. State whether this statement is true or false giving reasons.

(b) First term of a geometric progression is 0.2 and the second term is 0.04. Express the 6^{th} term as a power.

(08) In the following constructions use only a straight edge with a cm/mm scale and a pair of compasses. Show the construction lines clearly.

(i) Draw the straight line AB = 10cm. Construct the locus of a point moving equidistant to the two points A and B. Name the point it meets AB as C.

(ii) Find the point D on the locus in (i) above, such that $A\hat{B}D = 60^{\circ}$.

(iii) Construct the circle which touches the straight line AB at C and whose centre is on the angle bisector of $D\hat{A}B$. Name the centre as O.

(iv) Give a name for the circle you constructed, with respect to the triangle ABD. What are the reasons for your decision?

(v) AO produced meets DB at E. Construct the triangle ACF which is equal in area to the triangle ACE and such that the vertex F is on the circle.

(09) The table given below represents information about the attendance of 50 students in the first term at a certain school.

Number of days attended to school (class interval)	11 - 19	20 - 28	29 - 37	38 - 46	47 - 55	56 - 64
Number of students	5	6	10	14	11	4

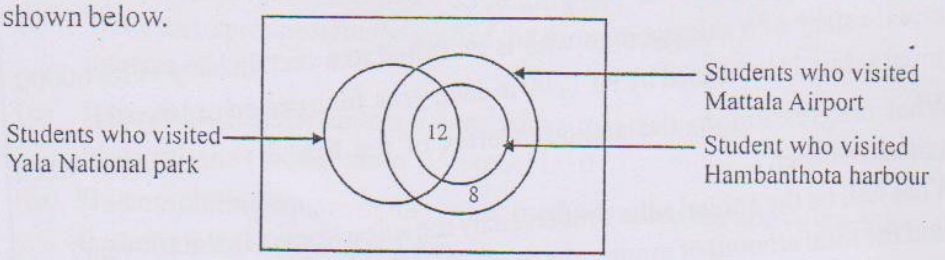
(i) Which class interval represents the number of days attended by most of students.

(ii) According to the above information, find the mean number of days of attendance of a student, to the nearest whole number.

(iii) If the school was held for 65 days in the first term, express the mean number of days of attendance of a student as a percentage.

(iv) Out of 50 students 32 are girls and the mean number of attendances of a girl is 38. Hence, find the mean number of attendance of a boy. Explain giving reasons, whether girls or boys have more trend to attend school.

(10) An incomplete Venn diagram containing the information about visiting the 3 places Mattala Air port, Hambanthota harbour and Yala National park by a group of 100 students is shown below.



(i) Copy the Venn diagram on to your answer script and write the number of students visited all three places.

(ii) Shade the region which represent, the students who visited only Mattala Airport.

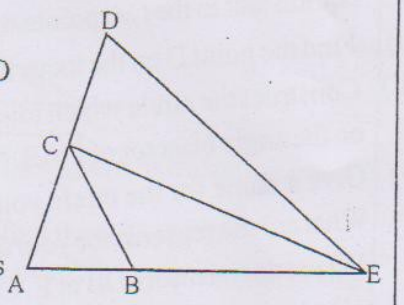
(iii) Number of student visited Mattala Airport is 80 and the number of students visited Hambanthota Harbour is 50. Find the students visited both Yala National park and Mattala Airport.

(iv) If all students have visited at least one place, find the number of students , who did not visit Hambanthota harbour.

(v) If one student is selected randomly, find the probability that he is a student who visited only Yala National park.

(vi) If the students who visited Yala National park did not visit Air port or harbour, draw a Venn diagram to represent this situation.

(11) In the triangle AED, B and C are two points on AE and AD respectively, such that AB = BC and CE = DE.



(i) Copy the figure and mark the given data.

(ii) Show that $B\hat{C}E = B\hat{E}D$

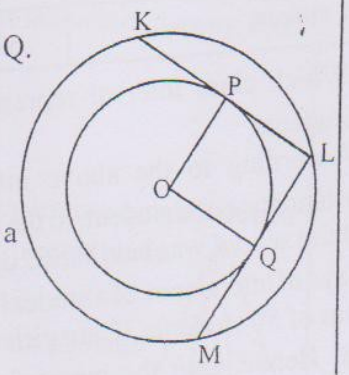
The straight line passes through the point D, which is parallel to CB meets AE at P

(iii) Prove that $\triangle BC\vec{E} \equiv \triangle PDE$

(iv) Show that AB = PE.

(v) Show that APD is an isosceles triangle, using equi - angular triangles.

(12) Two concentric circles whose centre O are given in the figure. KL and ML are two tangents drawn to the small circle at P and Q. The two tangents meets at the point L. K, L and M are three points on the circumference of the big circle.



(i) Find the value of $O\hat{P}L$.

(ii) Find the radius of the big circle in terms of a , if OP = PL = a

(iii) Giving reasons, find the value of $P\hat{O}Q$.

(iv) Show that KM = 2PQ

(v) What is the name of KM with respect to the big circle.

(vi) Show that the area of the triangle KML is twice the area of the quadrilateral OPLQ.