

# Department of Education - Western Province

## Year - End Evaluation - 2011

### Grade - 11 Mathematics - I

Name / Index No :- .....

Time : 2 hours.

- ◆ Questions in part A 1 - 10 carries 1 mark each.  
11 - 30 carries 2 marks each
- ◆ Questions in part B carries each 10 marks.

#### Part - A

Answer all questions on this paper it self.

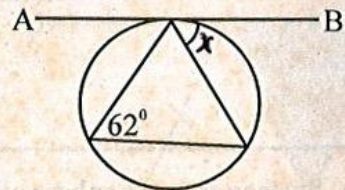
(01) Simplify  $0.02 \times 3$

(02) If  $\frac{x}{2} = 5$ , find the value of x.

(03) Write  $a^{-2}$  in positive index form.

(04) If 4 pens cost Rs 60, find the price of a pen.

(05) AB is a tangent to the circle  
Find the magnitude of x.



(06) If two apples were divided equally among three children, write the fraction of one gets.

(07) Find an arithmetic mean between 7 and 13

(08) Write the inequality denoted on the number line.



(09) Find the **median** of the data set.

3, 8, 10, 10, 11, 15, 18

(10) What is the intercept of the straight line,  $y = 2x - 3$

(11) Give  $\frac{2}{5}$  as a percentage.

(12) If  $\epsilon = \{1, 3, 5, 7, 9, 10\}$  and  $Q = \{1, 5, 10\}$

Denote it on a Venn diagram and write the set  $Q'$

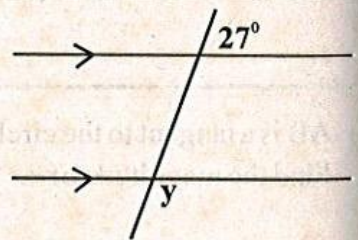
(13) If the ratio between sand, cement and metal is 5 : 3 : 2 find the following amount needed for 12 pans cement.

Number of pans of sand .....

Total number of pans in the mixture .....

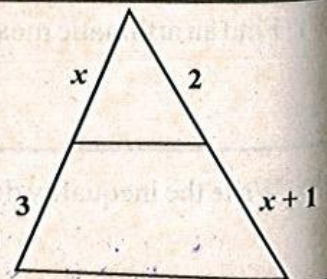
(14) Factorize  $18 - 8x^2$

(15) According to the given diagram find the magnitude of  $y$ .



(16) Surface area of a sphere of radius  $r$  is  $4\pi r^2$ . Find the total surface area of a circumscribed cylinder.

(17) Find the value of  $x$  of the given diagram.

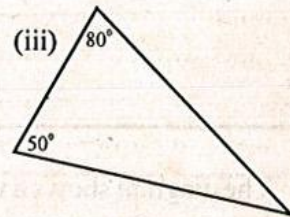
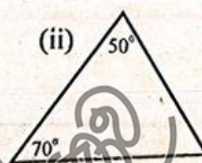
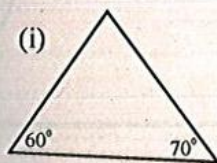


(18) A person invest Rs 65 000 to buy Rs 10 shares at Rs 13. Find the nominal value of those shares.

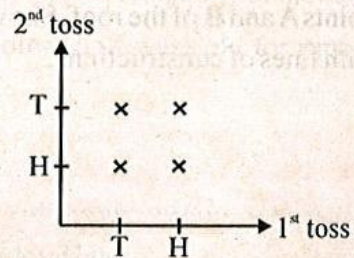
(19) If  $\tan \theta = 2$ , find  $\sin \theta$ .

(20) There is 5000l petrol in a bowser which has a uniform speed. Since there is a leak in the petrol tank, 100ml petrol is wasted, while travelling 1km distance. Calculate the remaining volume of petrol. in the tank when it reaches to a petrol shed 200km ahead.

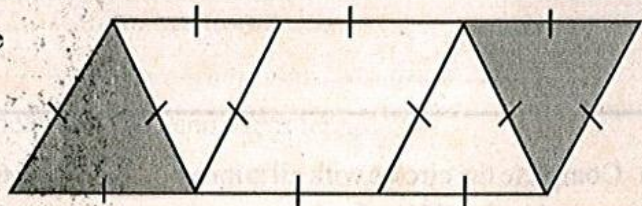
(21) Select the pair of equi - angular triangles out of the following figures.



(22) If an unbiased coin is tossed twice the possible out comes is denoted on the dotted graph. Find the probability of getting heads at least once.



(23) Write the fraction for the shaded area out of the total.



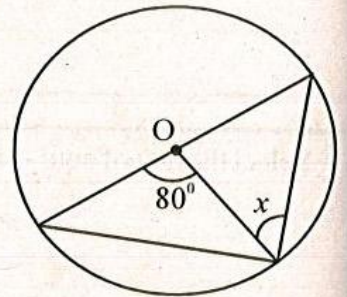
(24) Simplify  $110_{\text{two}} \cdot 11_{\text{two}}$

(25) If  $\sqrt{3} = 1.732$ , then find  $\frac{1}{\sqrt{3}}$ .

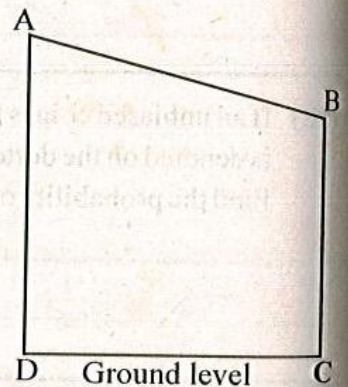
(26) Three people can finish painting a house with in four days. If one doesn't come to work how many extra days needed to complete the work.

(27) The annual rate of assessment tax is 5%. Find the assessment tax for one quarter for a house assessed Rs20 000.

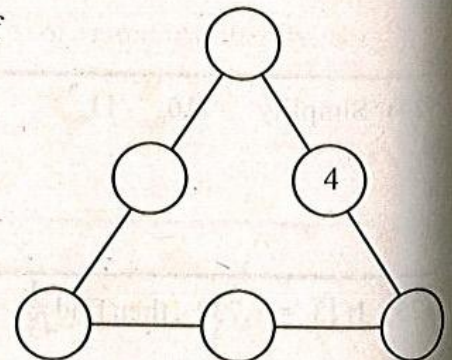
(28) O is the centre of the given circle. Find the magnitude of  $x$ .



(29) The diagram shows a wall ABCD of a house. A bulb should be fixed 3m away from the ground level and equi-distant to the given two points A and B of the roof. Show a suitable position with a rough sketch with lines of constructions.



(30) Complete the circles with all number 1, 2, 3, 5 and 6 to get the sum of each side should be nine.



Part - B

Answer all questions.

(01) Kamal won a lottery of Rs. 80 000 and deposited Rs 48 000 in a bank, where the rate of annual compound interest is 8%. He wishes to use the remainder to settle a loan of Rs. 20 000 with the interest which he took three years before.

(i) Give the ratio in simplest form between the amount of the lottery and the amount deposited in the bank.

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(ii) Calculate the total interest for the deposited amount in the bank after two years.

.....  
.....

(iii) If the rate of annual simple interest for the loan is 20%, calculate the total interest to be paid.

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(iv) Explain with calculations, whether the amount in his hand is enough to settle the loan and the interest.

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(02) A father gave  $\frac{1}{3}$  of his land to the daughter and the remainder to the son. Son donates  $\frac{3}{4}$  of his land for a play ground. In half of the remaining area he built a house and the other half was sold for rupees one million.

(i) Give the son's portion as a fraction.

.....

(ii) Find the percentage of the area given to the play ground out of the total land.

.....  
.....

(iii) Find the total fraction of the area of the land belongs to son and daughter now?

.....  
.....  
.....

(iv) If the sold amount of land is 40 perches, find the area of land which he put up his house in perches.

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(iv) Calculate the value of the total land which belongs to the father in rupees million.

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(03) (a) The following informations are collected from a set of to workers of an institute about the preference in eating fish and meat.

- ★ The number of workers who like fish  $n(F) = 38$
- ★ The number o workers who like meat  $n(M) = 30$
- ★ The number of workers who do not eat fish or meat is 15

(i) Give the relation ship between the cardinalities of the workers who would like to eat fish or meat,

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(ii) By using the above relationship, find the number of workers who eat fish and meat both.

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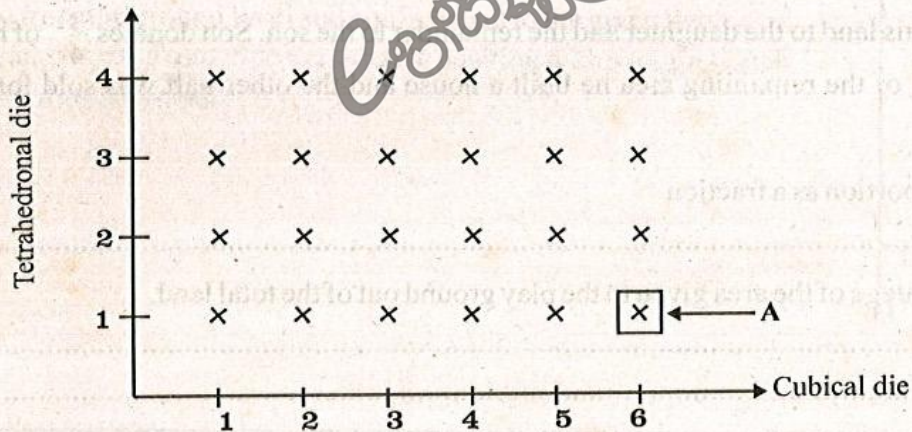
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(iii) How many workers like to eat only fish?

.....

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(b) The following dotted graph gives the results when a cubical and a tetrahedral dice tossed together.



(i) Express the event A in words.

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(ii) Find the probability of getting one in tetrahedral die.

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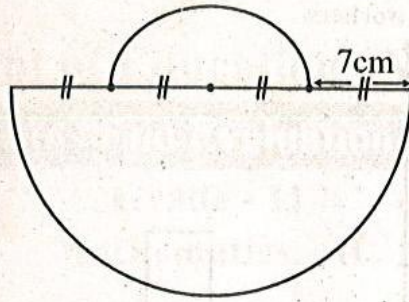
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(iii) Find the probability of the sum of the values of two dice being a prime number.

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- (04) The given figure shows an incomplete diagram of a badge which was prepared for a creative exhibition done by Sunimal.



He wishes to prepare it by joining two semi circles of radius 7cm and 14cm according to the above.

- (i) Find the area of the small semi - circle.

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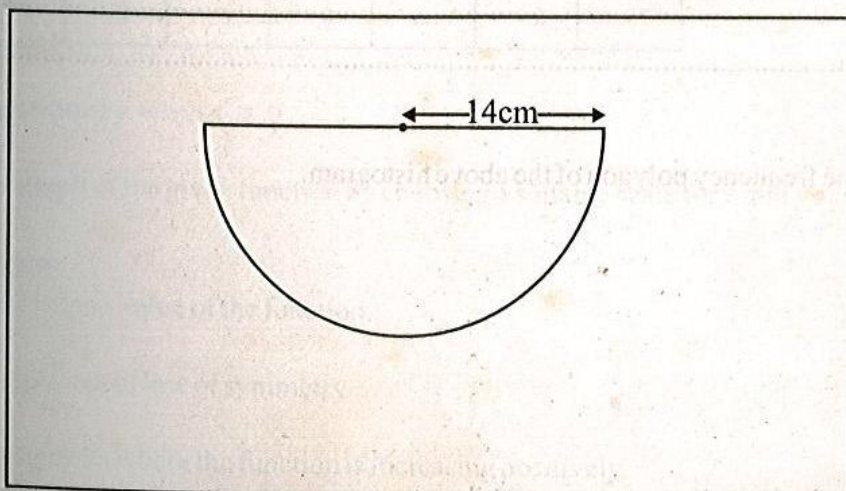
- (ii) Give the ratio between the areas of the small semi - circle and the large semi - circle.

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- (iii) To decorate the badge he needs to paste a silver cord around the outer edge. Calculate the minimum length of the cord.

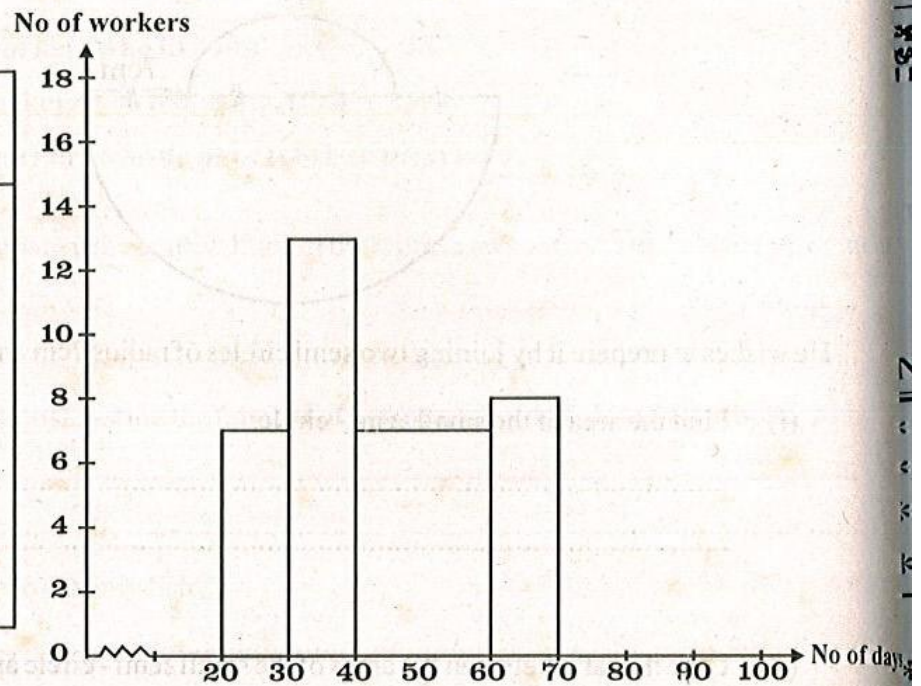
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- (iv) It is necessary to paste coloured semicircles of radius 7cm, on the given large semicircle without overlapping. How many semi - circles can be pasted on it. Draw a rough sketch by showing the centres of those semi - circles clearly.



(05) The following incomplete table gives the information about the number of workers who assumed duty in a road development site for a certain time period.

Class Interval (No of workers)	No of days (frequency)
20 - 30	7
30 - 40	.....
40 - 60	.....
60 - 70	8
70 - 100	18



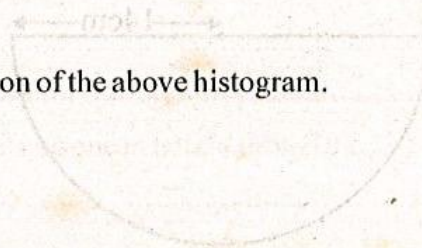
- (i) Complete the blanks of the table according to the given histogram.
- (ii) Draw the last column of the histogram according to the class interval 70 - 100.
- (iii) What is the time period where the above data is collected.

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 .....

- (iv) Some one says that the minimum attendance of workers for that certain time period is more than 3000. Do you agree with this statement? Give reasons.

.....  
 .....

- (v) Draw the frequency polygon of the above histogram.





# Department of Education - Western Province

## Year - End Evaluation - 2011

### Grade - 11

### Mathematics - II

Name / Index No :- .....

Time :  $2\frac{1}{2}$  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 right circular cone of base radius  $r$  and height  $h$  is  $\frac{1}{3}\pi r^2 h$ .
- The volume of a solid sphere radius  $r$  is  $\frac{4}{3}\pi r^3$ .

#### Part - A

Answer five questions only.

01)

Pay Rs 10 000 and take a valuable computer home.  
Rest in 10 equal installments of Rs 8 880

The above is an advertisement on a news paper about a computer of out right payment Rs 90 000.

- (i) Find the balance to be paid as a loan.
- (ii) Calculate the total interest to be paid?
- (iii) Find the number of month units which the interest to be paid?
- (iv) Calculate the interest per one month unit?
- (v) Find the rate of annual interest.

02) An incomplete table of  $y$  for the values of  $x$  of the function  $y = 2 - (x + 1)^2$  is given below.

$x$	-4	-3	-2	-1	0	1	2
$y$	-7	-2	1	2	.....	-2	-7

- (a) (i) Find the value of  $y$ , when  $x = 0$
- (ii) Sketch the graph of the given function by choosing a suitable scale for  $x$  and  $y$  axes.
- (b) By using the graph,
  - (i) Find the maximum value of the function.
  - (ii) Write the equation of line of symmetry.
  - (iii) Give the range of  $x$  where the function is increasing positively.
  - (iv) Write the equation of the function where it has a maximum value and the co-ordinates of the vertex be  $(-1, 0)$

(03) (a) The trinomial  $3 - x - 2x^2$  is divisible by  $(1 - x)$  without a remainder. Find the other factor.

(b) Simplify.  $\frac{2}{x-1} - \frac{1}{x}$

(c) Find the solutions of the quadratic equation  $2x^2 - 4x - 7 = 0$  by completing square or any other method to nearest two decimal places. (take  $\sqrt{2} = 1.414$ )

(04) (a) Find the value of  $x$  by solving the equation  $2x^2 - 2^x = 31$

(b) (i) If  $A = \begin{pmatrix} 0 & y \\ 2x & -1 \end{pmatrix}$  write the matrix  $2A$

(ii) Find  $x$  and  $y$  such that  $2A + \begin{pmatrix} 2 & y \\ -1 & 3 \end{pmatrix} = \begin{pmatrix} 2 & 7 \\ y & 1 \end{pmatrix}$

(iii) Write the above  $x$  and  $y$  values in a column matrix and write the order of it.

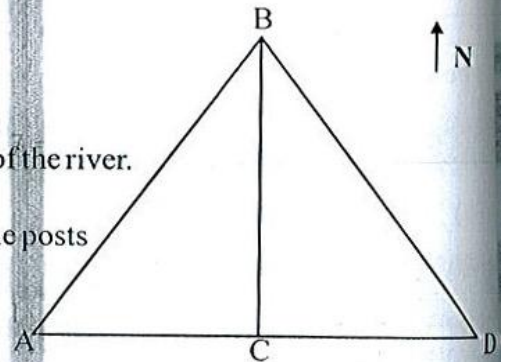
(05) (a) A river flows to East from West and a person walks towards to East along a straight river bank and can see a telephone post B at a bearing of  $070^\circ$  from a point A. If he continues his walk, up to 80m to the point C, the post B can be seen in North direction. Then he meets another telephone post D on his way towards East.

(i) Copy the diagram and mark the data on it.

(ii) Using trigonometrical ratios calculate the breadth BC of the river.

(take  $\sqrt{2} = 1.414$ )

(iii) If 50m length wire is placed between the two telephone posts B and D, find the bearing of B from D.



(b) Draw a scale diagram by mentioning the scale for the following data.

(i) The angle of elevation of a top of a building is  $40^\circ$  from a point X. The point X is 225m away from the base of the building.

(ii) By using the scale diagram, find the actual height of the building.

(06) (a) A solid right metal cone of radius of the base 7cm and perpendicular height 14cm was melted and prepared a solid hemi - sphere without any wastage.

(i) Show that the slant height of the cone is  $7\sqrt{5}$  cm.

(ii) Find the volume of the prepared hemi - sphere.

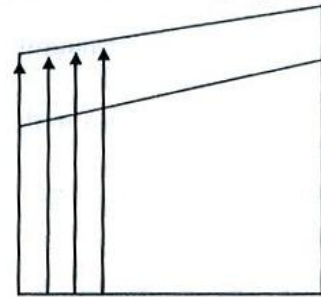
(iii) Find the radius of the solid hemi - sphere to the nearest whole number.

(b) Simplify by using log table.  $\frac{2.478}{\sqrt{0.564 \times 10}}$

## Part - B

Answer five questions only.

- (a) According to the given rough sketch, a technician cut the pieces of vertical iron rods to prepare a gate with following measurements in order.  
150cm, 154cm, 158cm, 162cm, .....



- (i) According to the above, find the height of the 9<sup>th</sup> rod.  
(ii) If the highest rod is 226 cm, how many iron rods are there in the gate.  
(iii) Find the minimum total length of the iron rods needed in meters.

- (b) By inserting three terms between  $\frac{2}{3}$  and 54, can obtain a geometric progression. Find the common ratio of that progression.

8) By using the cm/mm straight edge and the compass only,

- (i) Construct the triangle ABC where  $AB = 6\text{cm}$ ,  $\hat{BAC} = 60^\circ$  and  $AC = 6\text{cm}$ .  
(ii) Construct a line AX where  $\hat{BAC} = \hat{CAX}$ .  
(iii) Mark a point D on line AX where ABCD is a rhombus and complete the rhombus ABCD. Measure the radius and write.  
(iv) Construct the circle which touches AB at point A and passing through the points C and D. Measure the radius and write.

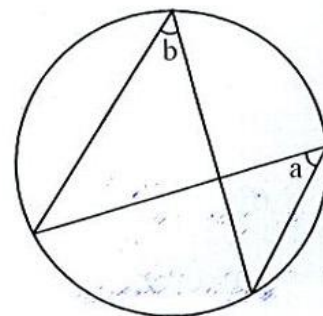
9) The following table gives the information about the sales of bread from a bakery with in two months.

- (i) What is the modal class.  
(ii) Copy the information given in the table to your answer script and calculate mean number of loaf of bread sold per day, by selecting the mid value of the modal class interval as the assumed mean.  
(iii) If the price of a loaf of bread is Rs. 50, calculate the income of that bakery during those two months by selling bread.

No of loaf of bread	No of days
50 - 58	6
58 - 66	8
66 - 74	11
74 - 82	14
82 - 90	10
90 - 98	7
98 - 106	4

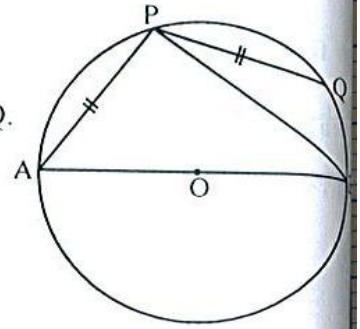
10) (a) According to the given diagram

- (i) Write a relationship between the angles a and b  
(ii) Write the geometrical theorem related to the above relationship.



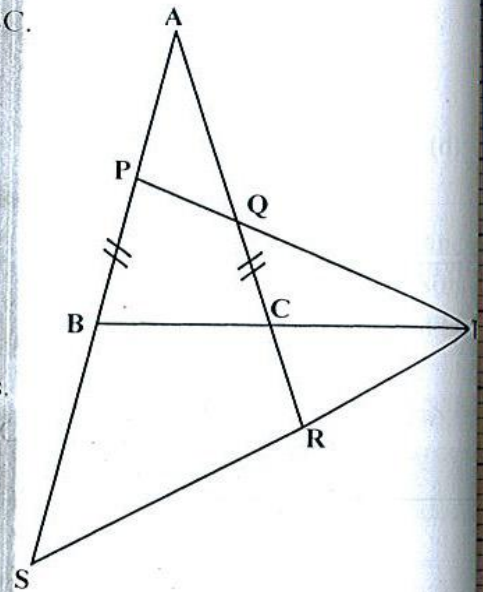
- (b) AB is a diameter of a circle with centre O. AP and PQ are equal chords in length.

- Copy the given diagram to your answer script and join PO and AQ.
- Find the magnitude of the angle  $\hat{APB}$ .
- Name two angles equal to angle  $\hat{PAQ}$ .
- Prove that  $QB \parallel PO$  by giving reasons.



- (11)  $AB = AC$  in the isosceles triangle ABC. T lies on the produced BC. The points P and S lie on the produced AB such as  $\hat{PTB} = \hat{BTS} = y$ . If AC produced to R and  $\hat{ACB} = x$  then,

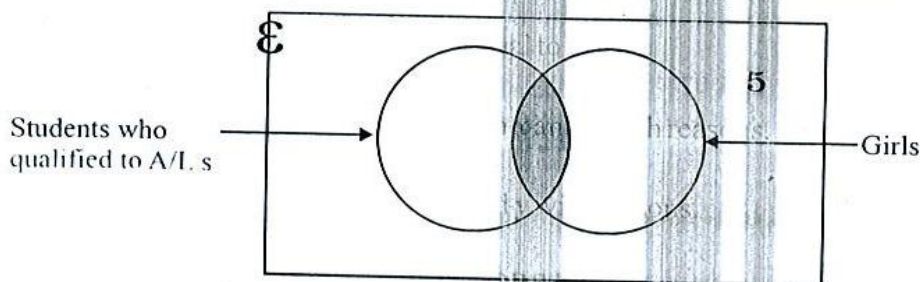
- Copy the diagram and mark the given data on it.
- Name two angles which is equal to  $\hat{ACB}$ .
- Write the value of  $\hat{CRS}$  in term x and y with reasons.
- Write the value of  $\hat{TPB}$  is x and y with reasons.
- Prove that the quadrilateral PQRS is cyclic.



- (12) (a) The winner of the 1st round of a quiz is selected considering the least time taken to answer the questions out of 10 competitors. Only the winner can participate for the second round and  $\frac{1}{8}$  is the probability of winning the second round.

- Draw the tree diagram to denote the possibilities of a competitor winning the game or not.
- Find the probability of a competitor winning both rounds.

- (b) 39 students qualified for (A/L) class out of 50 children in a class. Number of girls in the class is 26



- Copy the Venn diagram to the answer script and complete it.
- Express the shaded area of the Venn diagram in words.
- How many male students qualified for A/L.

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