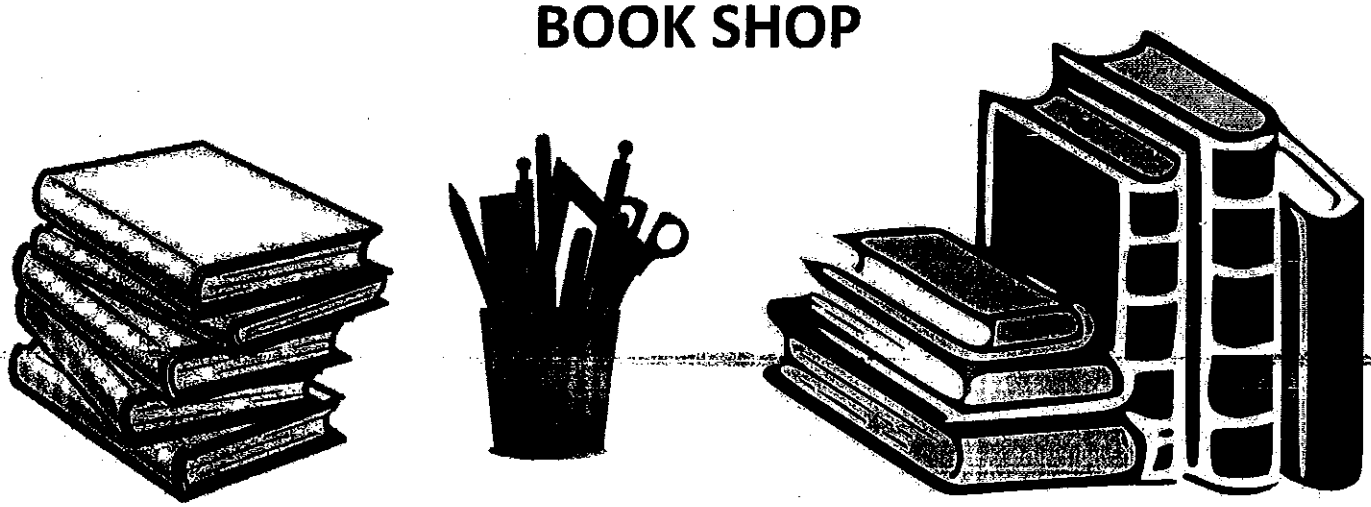
GRADE 11

SECOND TERM PAST PAPERS

(ENGLISH MEDIUM)

BOOK SHOP



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வலயக் கல்வி காரியாலயம் - கொழும்பு
Zonal Education Office - Colombo
දෙවන වාර පරීක්ෂණය - 2022
இரண்டாம் தவணைப் பரீட்சை - 2022
Second Term Test - 2022

Grade 11 **Mathematics I** **Time: Two hours**

Name : .....

Class : .....

.....
Teacher's signature

Important:

- Answer all questions in the paper itself.
- It is necessary to indicate the relevant **steps** and **correct units** in answering the questions.

Marks will be awarded as follows:

- In **Part A** 2 marks for each question.
  In **Part B** 10marks for each question.

For marking examiner use only.

Que no.		Marks
A	1-25	
B	1	
	2	
	3	
	4	
	5	
Total		

.....
marking examiner

Part A

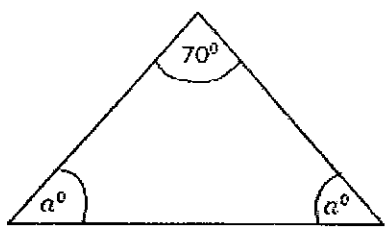
Answer **all** questions **on this question paper itself.**

Area of curved surface of a right circular cylinder of radius r and height h is $2\pi rh$

01. Customs duty of 10% will be charged for a certain type of imported good. How much duty must be paid when an item of this type of value Rs.80000?

02. Find the factors. $x^2 + 4x - 12$

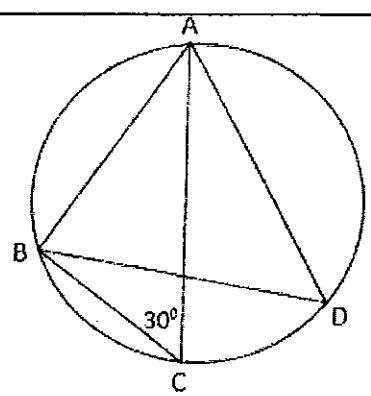
03. Using the information given in the figure, find the magnitude of **a.**



04. If it is given that $\log_2 a = 6$, write the value of a as a power of 2.

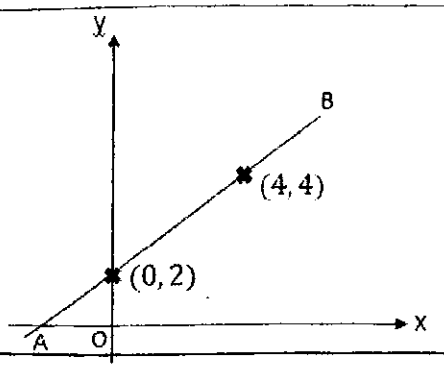
05. Find the time it takes to fill a tank of capacity 400 liters using a pipe through which water flows at a rate of 80 liters per minute.

06. AC is a diameter and the points A, B, C and D lie on the circle shown in the figure. $A\hat{C}B = 30^0$. Find the values of $A\hat{B}C$ and $A\hat{D}B$.



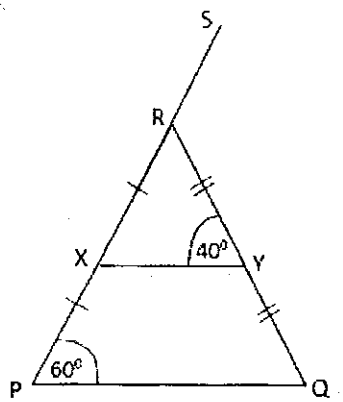
07. Base radius of right circular cylinder is 14 cm. Its height is 10 cm. Find the area of the curved surface of the cylinder. (Use $\frac{22}{7}$ for the value of π.)

08. Find the gradient of the straight line represented by AB in the figure.



09. Simplify $\frac{ab}{3} \div \frac{2a}{6b}$

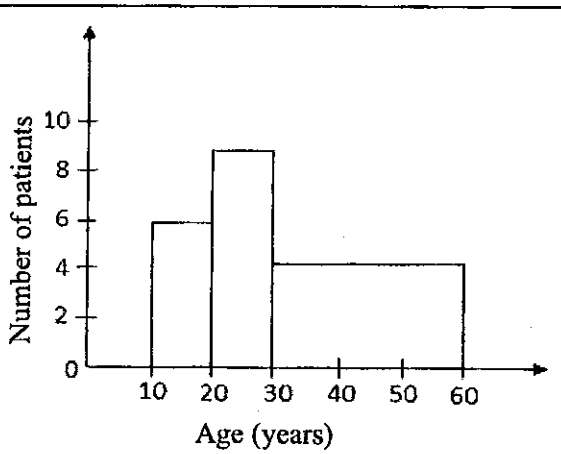
10. In the given figure, the side PR of the triangle PQR is produced to S. The midpoints of PR and QR are X and Y respectively. If $X\hat{Y}R = 40^o$ find the magnitude of $Q\hat{R}S$.



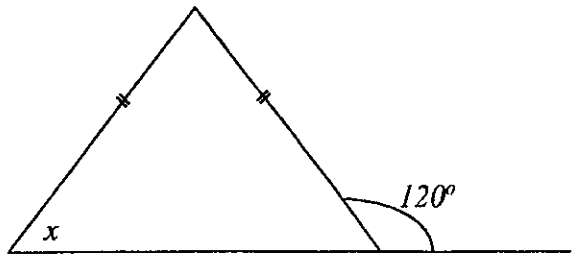
11. Solve $2x^2 - 50 = 0$

12. A man takes a loan of 6000 rupees for two years at an annual interest of 10% with the interest compounded annually. How much is the interest for the second year for this loan amount?

13. The following histogram represents some information of patients who came for OPD of a rural hospital in a certain day. Find the total number of patient who came for OPD in that day.

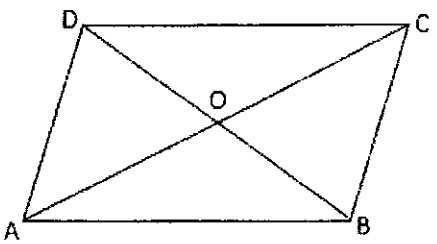


14. Using the information given in the figure, find the magnitude of x?



15. Express the sixth term in the geometric progression 4,8,16... as a power of 2.

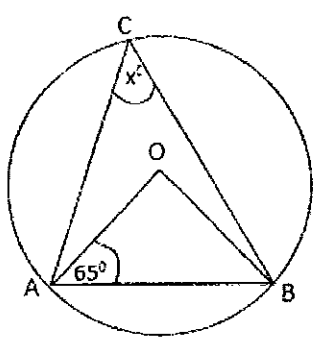
16. A parallelogram ABCD is given in the figure.
For each statement in the table, if it is correct mark a '√ ' in front of it and if it is incorrect mark a 'x' in front of it.



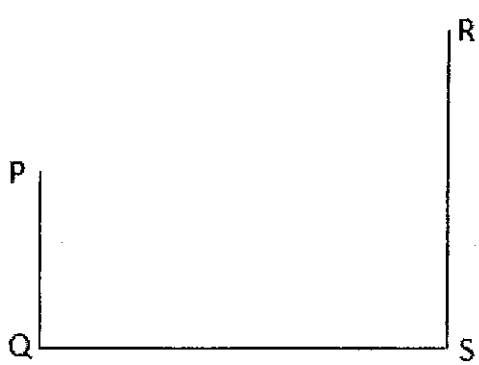
(1)	AO=OC and BO=OD	
(2)	$A\hat{D}C = B\hat{C}D$	

17. Find the least common multiple of the following three algebraic terms:
$2x^2, 8xy, 4y$

18. The centre of the circle in the given figure is O. Find the value of x according to the information indicated in it.



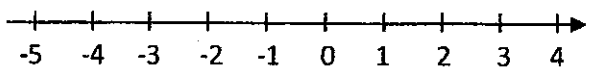
19. Two vertical pillars PQ and RS located on a level ground are shown in the figure. When observed from P, the angle of elevation of R is 32° and the angle of depression of S is 52°. Represent this information in the figure.



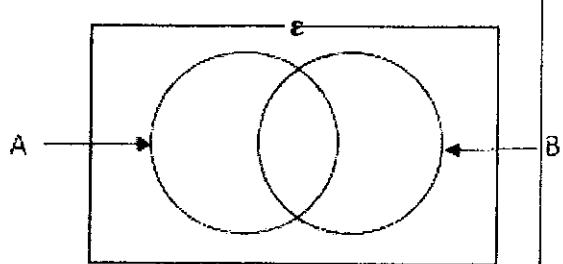
20. A bag contains 55 identical pencils. A certain number of them are yellow while the rest are red. If the probability of a pencil picked randomly from the bag being yellow is $\frac{5}{9}$, how many yellow pencils are there in the bag?

21. Fill in the blanks in the following statement using suitable geometric terms.
"The .....drawn from the center of the circle to a chord ..... the chord"

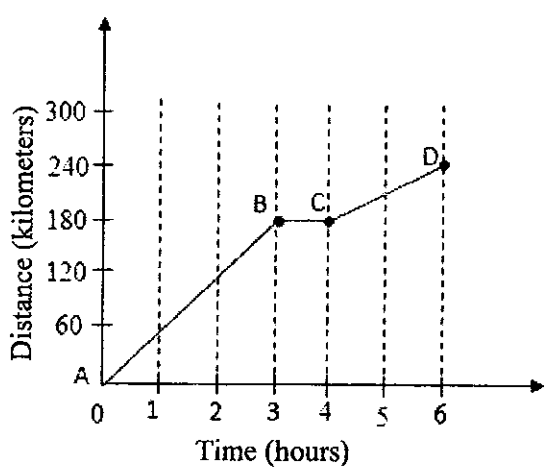
22. Solve the inequality $3x+1 \leq 7$ and represent all the values that x can take on the number line



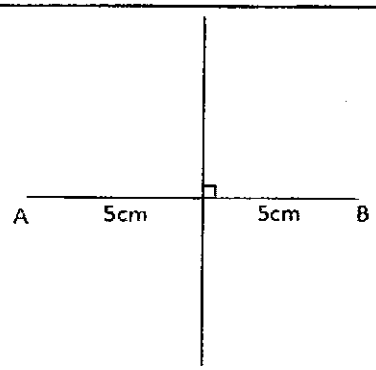
23. A group of students represents in the given Venn diagram. The set of students who like to eat ice-cream is represented by A and the set of students who like to eat fruit is represented by B. In the Venn diagram, shade the regions that represent the students who like only one of these two.



24. A distance-time graph that represents the motion of a motor vehicle is shown in the figure. Which part of the graph shows the motor vehicle travelling in its highest speed? What is that speed?



25. A portion of the locus of point that moves at a constant distance of two fixed points A and B is indicated in this sketch. Indicate by a sketch on this figure, how the points are at a 7 cm from A, are found.



Part B

Answer all the questions in this paper

1. When concreting a road, $\frac{5}{8}$ of the total length was completed on the first day and $\frac{2}{3}$ of the remaining length was completed on the second day.

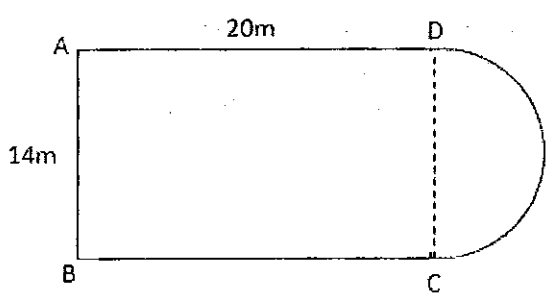
   i. At end of the first day, what fraction of the total length of the road remained to be completed?

   ii. What fraction of the total length of the road was completed on the second day?

   iii. At the end of the first two days, a further length of 200m of the total length of the road remained to be completed. Find the total length of the road.

   iv. It has been estimated that three men will require 4 days to concrete the remaining 200 m of the road. How many more men needed to be engaged to concrete this length in two days?

2. The given figure is a sketch of a garden consisting of a rectangular portion ABCD and a semi-circular portion with diameter DC. (Take the value of π as $\frac{22}{7}$)



   i. It has been decided to fix lamp post along the edge of the semi-circular portion, from D to E, such that the distance between every two adjacent posts is 2m. How many lamp posts are required for this?

   ii. Calculate the total area of the garden.

   iii. If there is right angled triangular portion DCE, with its area equal to the area of the semi-circular portion and its base length equal to the length of DC, find the length of CE and sketch, with measurements on the same figure.

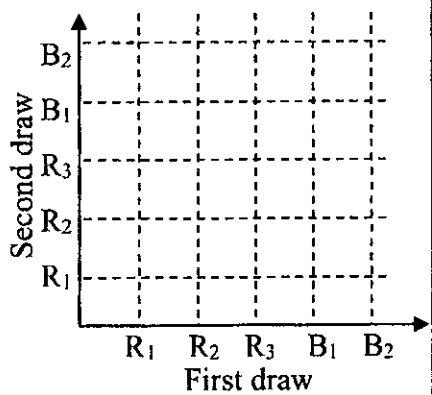
Due to an influence of some disease, 120 mangosteen plants are removed, and orange plants are cultivated.

iii. Find the number of mangosteen plants in the cultivation after the change of the plants.

iv. Find the angle at the center for the mangosteen plants and orange plants in the pie chart according to the changed data.

5. (a) There are 3 red balls 2 blue balls in a bag. Sunil draws a ball from the bag randomly. Recorded its color and put it back. Another ball is drawn from the bag again. Its color is also recorded.

i) Represent the sample space of the color of the ball that Sunil draws randomly in the given grid using the mark 'x' (R_1, R_2, R_3, represent red balls and B_1, B_2 represent blue balls)

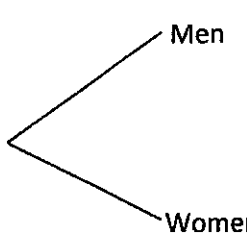


ii) Indicate the event of drawing a ball in same color, by encircling it in the grid, write down its probability.

b). During a pandemic season 30 men and 15 women who showed symptoms for a certain disease, had come for the clinic. All the women were found infected. The probability of male being infected was 0.8.

Given below is a tree diagram to show the probability of a randomly selected person from the set being male or female and being positive or negative for the disease.

i) Complete the tree diagram showing all the probabilities.



ii) Find the probability of randomly selected person being positive for the disease.

3. The following table represents the income tax rates implemented in 2016 by the Island Revenue Department.

Annual income	Tax percentage
Initial Rs. 500 000	Tax free
Next Rs. 500 000	6%
Next Rs. 500 000	10%

The annual income of Mr. Senaka who is a businessman is Rs. 1 300 000.

i. What is the amount that charged for the income tax?

ii. How much income tax does Mr. Senaka have to pay for that year?

Mr. Senaka has invested certain amount of money in a company. He said that the annual dividend income that he gained from the company is equal to above annual income tax amount.

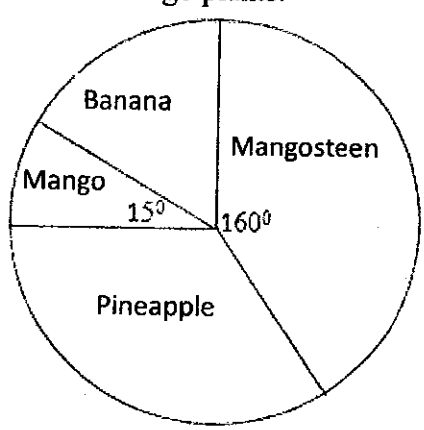
iii. If 10 rupee was paid for a share as the annual dividend, find the number of shares that Mr. Senaka owned.

iv. If the annual dividend income as a percentage of the invested amount is 40%, find the invested amount by Mr. Senaka on this company.

v. Find the marked price of a share.

4. The given pie chart represents the data on the variety of fruit plants that used for the cultivation. The number of banana plants is five times that of mango plants.

i. Calculate the magnitude of the angle at the center of the sector that represents the pineapple plants.



ii. If the difference between the banana plants and the mango plants is 240, find the total number of plants that used for the cultivation.

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Second Term Test - 2022

Grade 11 **Mathematics II** **Time : three hours**

- Answer **ten** questions selecting **five** questions from **Part A** and **five** questions from **Part B**.
- Each question carries **10** marks.
- The volume of right circular cylinder of radius r and height h is $\pi r^2 h$.
- The volume of a cone of radius r and height h is $\frac{1}{3}\pi r^2 h$.

Part A

*Answer **five** questions only.*

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

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

i. Find the value of y when x = -1.
ii. Using the scale of 10 small divisions as one unit along both x-axis and y-axis.
iii. Write down the interval values of x for which the function is positive.
iv. Express the given function in the form of $y = -(x-a)^2 + b$. Here a and b are constant values.
v. Find the positive root of the equation $x^2 + 2x - 2 = 0$ to the first decimal place and deduce a value for $\sqrt{3}$.

2.

A mobile phone can be purchased by
making an initial payment 5000 rupees and
paying the remainder in installment

The price of a certain type of a mobile phone is 35000 rupees when it is purchased outright. It can also be purchased by making down payment of 5000 rupees and paying the remaining amount with interest in 15 equal monthly installments of 2240 rupees each. If the interest for this method of payment is calculated according to the reducing balance method, calculate the annual rate of interest that is charged?

3. Nimal, who is in a horizontal floor, named AB, sees top of P of the vertical tower of PQ in 10m distance in an angle of elevation of 35° and sees the bottom in an angle of depression of 42°.

(i) Draw a rough sketch for the above information.

(ii) Find the height of the tower PQ, by drawing a scale diagram by taking the scale as 1:50.

(iii) Find the angle of elevation of P from a man standing at a point on BQ horizontal plane 2m away from B.

4. For a function, the organizing committee was decided to buy 50 pieces of cakes with chocolate flavored and vanilla flavored. The price of a piece of a chocolate flavored cake is Rs.200 and the price of piece of a vanilla flavored cake is Rs. 100. It cost Rs. 6500 to buy 50 pieces of cake in both.

i. By taking the chocolate flavored cakes as x and the vanilla flavored cakes as y, construct two simultaneous equations.

ii. Find the number of chocolate flavored cakes and the number of vanilla flavored cakes by solving the above simultaneous equations.

iii. Later, the organizing committee realized that, if they bought these cakes from another place, apart from the previous place with a chocolate flavored piece of cake as Rs. p and vanilla flavored piece of cake as Rs. q, the total cost could have been reduced than the initial cost. Using this information write down an inequality including 'p' and 'q'.

5. The following frequency distribution containing the information on the number of days off taken by the employees in a certain company in a year. (The class interval 5-10 denotes the number of leaves greater than or equal to five and less than 10)

Number of days off	0-5	5-10	10-15	15-20	20-25	25-30	30-35
Number of employees	6	14	20	10	9	6	5

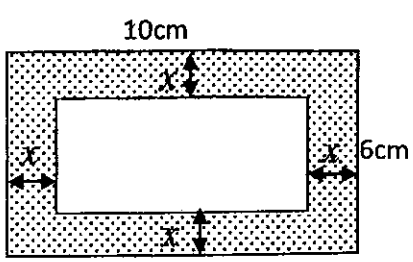
(i) What is the modal class of the distribution?

(ii) If they wish to reward, the employees with days off less than 10, how many will get rewarded?

(iii) By taking the mid value of the class interval 15-20 as the assumed mean, find the mean number of days off that has been taken by an employee?

(iv) According to the answer in the above (iii) find the expected loss of labor in man days in the year for the company.

6.



If the area of the new rectangular lamina obtaining, by removing x *cm* width part from the rectangular lamina having 10 *cm* length and 6 *cm* breadth as mentioned in the figure, was $40cm^2$.

Show that the 'x' satisfying the quadratic equation $x^2 - 8x + 5 = 0$ and find the breadth of the new rectangular lamina to the nearest first decimal place. (Take $\sqrt{11} = 3.32$)

Part B

*Answer **five** questions only*

7. (a) In an annual book fair in a certain city, the numbers of readers in first three days, nearest ten 560, 620,680 respectively. As an experience of the previous year records, if it is taken for nearest 10, number of readers increase according to an arithmetic progression. The book fair held 10 days.
   i. Find the common difference of the arithmetic progression.
   ii. How many readers can be expected to come in 10^{th} day.
   iii. If one ticket cost of Rs. 50, what is the expected income within 10 days?

   (b) Find the sum of the first 11 terms of the geometric progression 2, 6, 18, 54... in the form of 3^n-1

8. Use only a straight edge with a cm/mm scale and a pair of compasses for the following constructions. Show the construction lines clearly

   i. Construct the triangle ABC such that AB=6.5cm, BC=5cm and $A\hat{B}C = 45^{\circ}$
   ii. Construct the angle bisector of $A\hat{B}C$ and name its point of intersection with BC as O.
   iii. Construct a perpendicular from O to the side AB, name its foot as P, and construct the circle whose radius is OP
   iv. Measure and write its radius

9 (a) Define midpoint theorem in your own words with a figure.

   (b) In the triangle ABC, the midpoints of the sides AB and AC are D and E respectively. Line drawn through C parallel to AB, meet the produced side DE at F. Join DC and AF. Draw a suitable rough sketch and show that ADCF is a parallelogram.

10. (a) A right circular cylindrical vessel with base radius 'r' is filled with water up to 30cm. the water in this vessel is sufficient to fill 12 right circular conical shaped vessels with a radius 6cm and height of 15cm.

   Show that $r = 6\sqrt{2}$ cm and find the value of 'r' to the nearest centimeter.

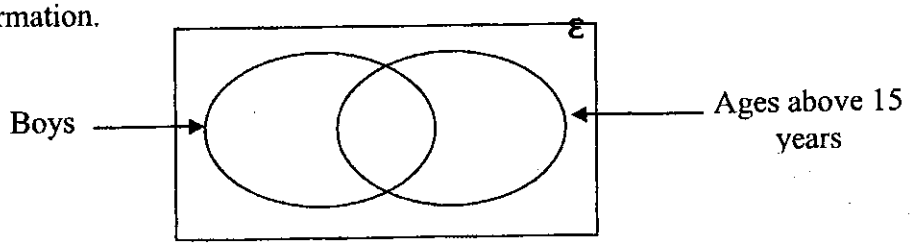
   (Take $\sqrt{2} = 1.41$)

(b) Using the logarithm table, find the value of A to the nearest second decimal place

$$A = \frac{\sqrt{58.2} \times 0.524}{6.02}$$

11. 50 students who have participated for a certain game. Among 26 boys 17 of them are above 15 years. The number of girls whose age below 15 years are 16.

(i) Copy the given Venn diagram to your answer script and complete it using given information.

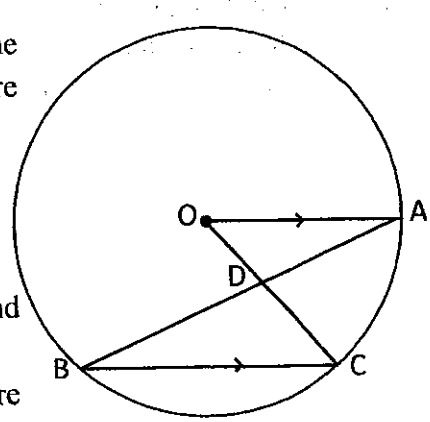


(ii) How many girls above 15 years are there?

(iii) Shade the region that represents boys below 15 years.

(iv) The number of girls below 15 years is twice the number of girls above 15 years. Is this statement true? Give reasons.

12. The center of the circle in the figure is O, and the radius OA and chord BC are parallel. AB and OC are intersecting at D.



i. Name an angle equal to $A\hat{B}C$

ii. Prove that $O\hat{D}B = 3O\hat{A}B$

iii. If $O\hat{A}B = 30^{\circ}$ write the relationship between OD and AB with reasons.

iv. Show that the triangles AOD and BCD are equiangular and using the above (iii), show that OD=DC.