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மேல் மாகாணக் கல்வித் திணைக்களம் - கொழும்பு கல்வி வலயம்
Western Provincial Education Department - Colombo Educational Zone

දෙවන වාර ඇගයීම -2016
இரண்டாம் தவணை மதிப்பீடு - 2016
Second Term Evaluation -2016

11 ශ්‍රේණිය தரம் 11 Grade 11	ගණිතය I පත්‍රය கணிதம் வினாத்தாள் - I Mathematics Paper - I	කාලය පැය දෙකයි *Two 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: two marks each for questions 1 – 25 in part A. 10 marks each for questions in part B.

For marking examiner's use only

Question number		Marks
A	1 – 25	
B	1	
	2	
	3	
	4	
	5	
Total		

.....
Marked by

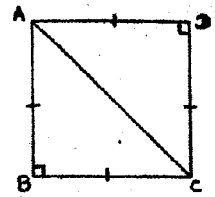
Mathematics - I
Part - A

Time : 2 hours

- Answer all questions on the paper itself.

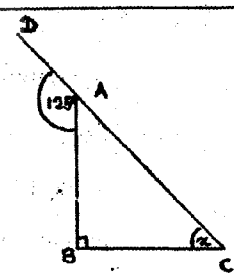
01 The assesed annual value of a certain house is Rs. 30 000. If the relevant provincial council charges 5% of the value of the house as rates, calculate the rates that have to be paid for a year.

02 If the length of the diagonal AC of the given square ABCD is $\sqrt{50}$ cm, find the area of the square.



03 Factorise $x^2 - 5x + 6$

04 In the right angled triangle ABC, the side CA is extended up to D. Find the value of X.



05 Select the answer suitable for the blank.

The nearest value of $\sqrt{8}$ is ..... (2.7 , 2.8 , 2.6 , 2.9)

06 There are 10 identical balls numbered from 1 to 10 in a bag. A ball is taken from the bag randomly. Find the probability of getting a triangular number.

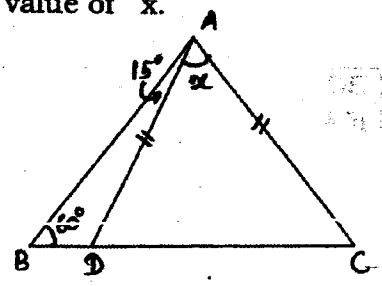
07 Find the value of (x + y) without solving the pair of simultaneous equations.

$5x + 3y = 8$

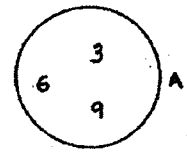
$4x + 6y = 10$

200

08 According to the data given in the figure, find the value of x.



09 Express the set A using the set builder method



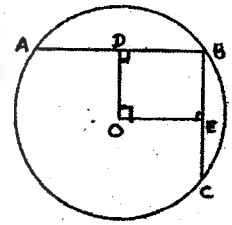
10 Find the value of x.

$216^{\frac{1}{3}} = 6^x$

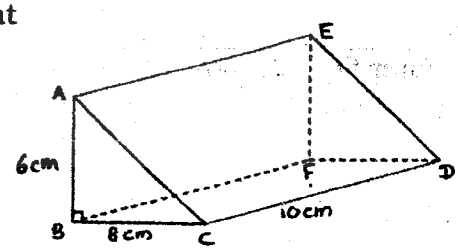
11 AB and BC are two equal chords of a circle of which the centre is O. OD ⊥ AB and OE ⊥ BC. If AB = 16cm,

i. propose a suitable name for the queadrilateral OEBD

ii. find the perimeter of it



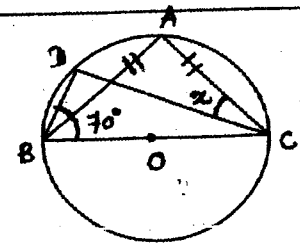
12 Draw two different faces of the given right prism with measurements



13 Solve the inequality $5x - 8 \leq 3x - 2$ and write the largest integral value that x can be taken.

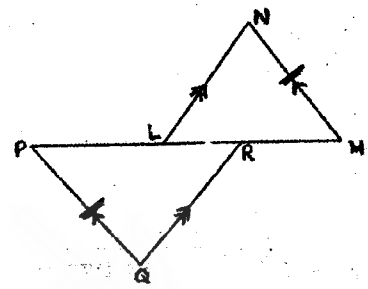
20 |

14 BC is a diameter of a circle with centre O.
If AB = AC and $\hat{DBC} = 70^\circ$, find the magnitude of x.



15 Find the gradient and the intercept of the graph of the equation,
$2y + 6x = 8$

16 If the triangle PQR is congruent to the triangle LMN, mark the necessary conditions on the triangles PQR and LMN to be congruent and write the case of congruency.



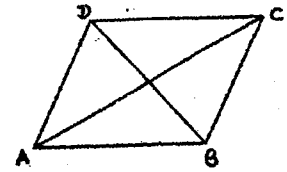
17 $\frac{2}{(x+1)} - \frac{4}{(1-x^2)}$ Simplity and underline the correct answer.

i) $\frac{2}{(1-x)}$ ii) $\frac{2}{(x-1)}$ iii) $\frac{-2}{(1-x)(1+x)}$

18 Water flows through a pipe at a uniform speed. If 120 l of water flow out the pipe in one minute, how long will it take to fill 300l of water in the tank.

19 Solve $(x+3)^2 = 49$

20 In the rombus ABCD, AB = 10cm and the length of the diagonal AC is 16cm. Find the length of the diagonal BD.



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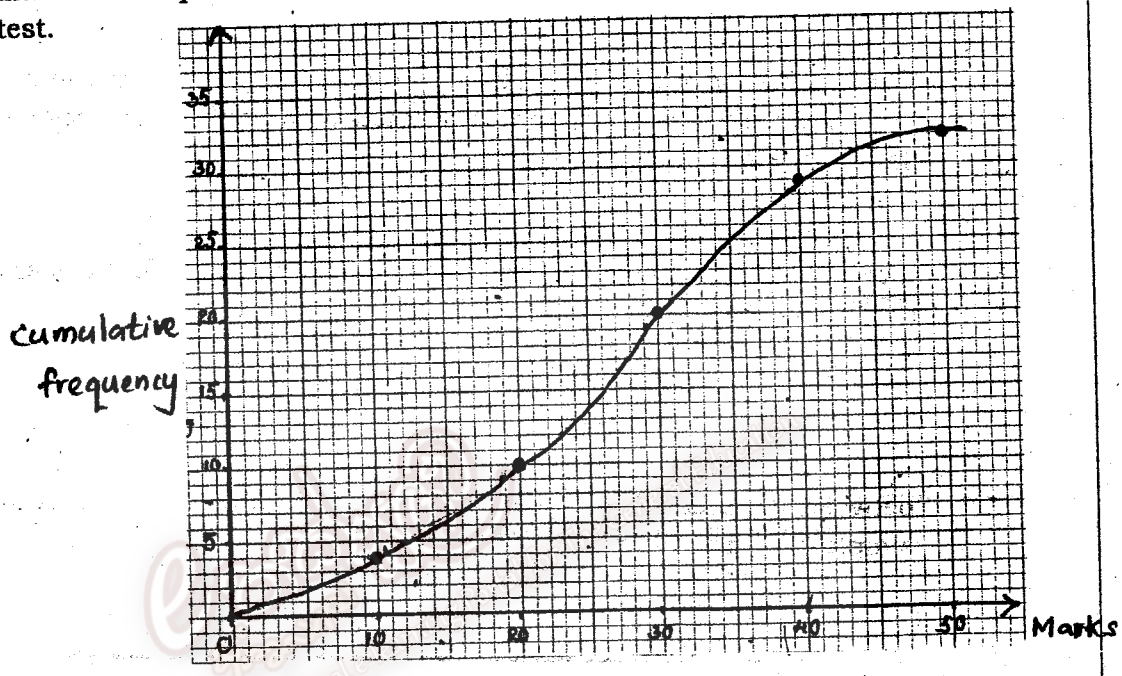
21 Simplify without using logarithmic tables.

$2 \lg 2 + \lg 25 - 2$

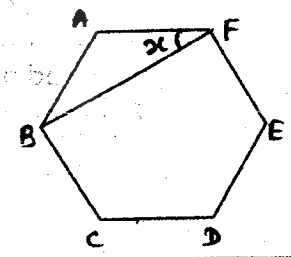
22 Fill in the blanks with suitable values.

$(x+4)^3 = x^3 + \square + \square + 64$

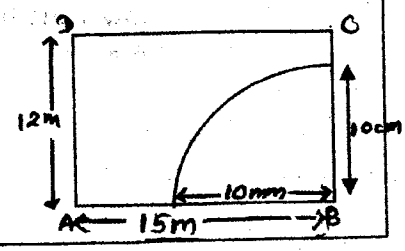
23 The given cumulative frequency curve illustrates the distribution of marks scored by 32 students for a certain subject. Accoridng to the graph what is the mark that seperates 10 students who have scored the highest marks at the test.



24 ABCDEF is a regular hexagon.
Find the value of x, in the trangle ABF



25 ABCD is a rectangular land the land owner decided to construct a well at the point P, which is located 8m away from the boundary line AB and 10m away from the point B. Complete the given sketch to find the location of P and mark the point P on it.



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Part - B

- **Answer all questions on the paper itself.**

01) Vegitables have been cultivated in $\frac{1}{3}$ of a land while paddy has been cultivated in $\frac{3}{4}$ of the remaining land. Rest of the land is an empty land.

i. Find the fraction of land which puddy has been cultivated

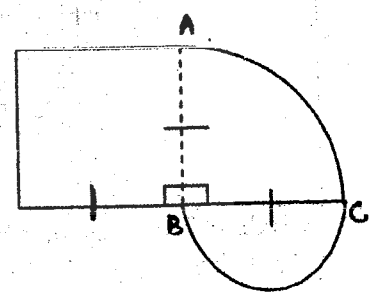
ii. Find the fraction of land which is empty

iii. If the owner of the land decided to cultivate vegetables in the half of the empty land, what is the new fraction of land which vegetables have been cultivated?

iv. If the area of the nearly cultivated land is 60 perches, find the area of the whole land.

v. The owner bought another land of 160 perches adjoining the remaining land and cultivated fruits in both lands. Find the ratio between the areas of the lands cultivated vegetables and fruits in the simplest form.

02) The figure shows the badge of a certain institution.
It consists of a square with a side 14cm, a semi circle and a quarter of a circle



i. Find the arc length of the semi circle.

i. Find the perimeter of the badge

ii. Show that the ratio between the areas of the quarter of a circle and the area of the semi circle is 2 : 1.

iii. If there is a right angled triangle (DBC) instead of the semi circle which area is similar to the semi circle, draw the right angled triangle having one side as BC and D is on the extended AB with measurements on the same diagram above.

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03)

a) Anil borrowed Rs. 60 000 from an institution at an annual simple interest rate of 11%. After three years he settled the loan by paying back the total amount of money.

i. Calculate the interest he has to be paid for a year.

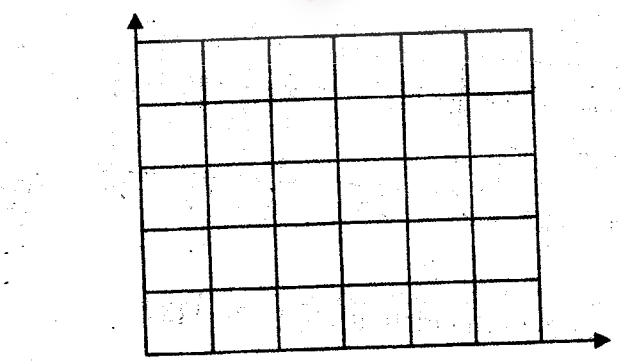
ii. What is the total amount that Anil has to be paid to settle the loan in three years?

iii. He deposited a certain amount of money from Rs. 60000 in another institution at annual simple interest rate of 15% and gained Rs. 22500 as the interest at the end of three years. Find the amount of money he deposited in the institution.

b) It takes 8 men 10 days to concrete a certain road. How many extra men are required to complete the same task in 4 days?

04) a)

i. A fair cubic die numbered from 1 to 6 and an unbiased tetrahedronal die numbered from 1 to 4 are rolled at the same time. The sides which touch the table are recorded in each case. Show the sample space in the given grid.



i. Find the probability of getting odd numbers in both dice.

ii. Find the probability of getting an odd number on one die and getting an even number on the other die.

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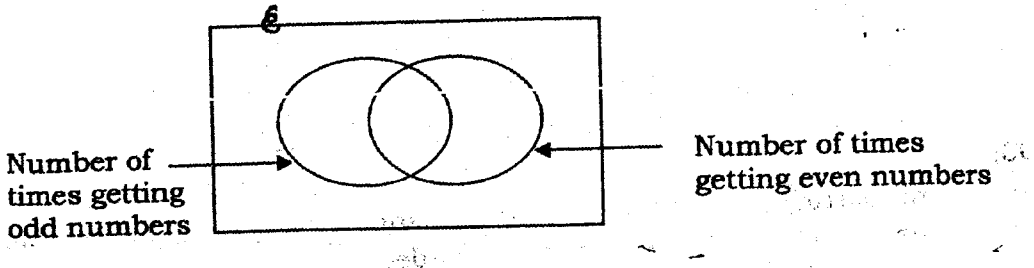
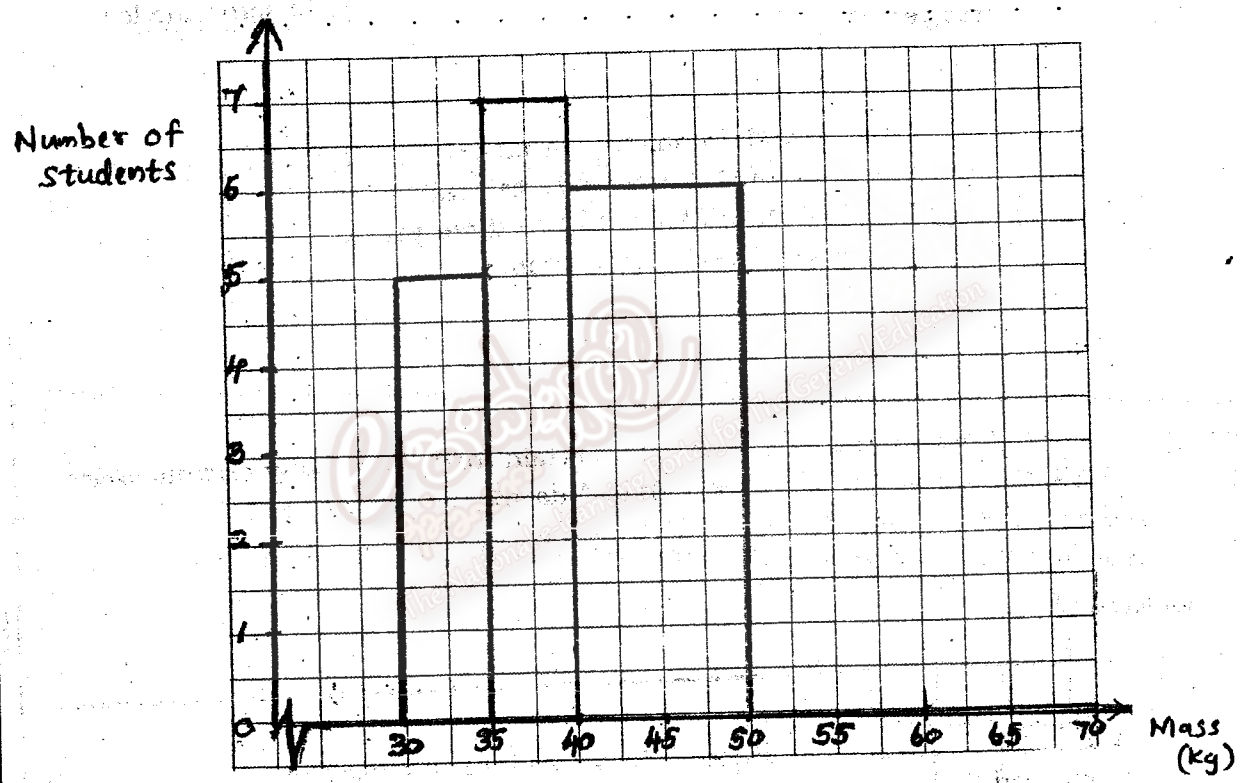
b) The given incomplete Venn diagram shows **the number of times** of getting odd numbers and **number of times** of getting even numbers in both dice. Complete the diagram with relavent information.



05) Given below is an incomplete table including the mass of a group of grade 10 students of a certain school.

mass (kg)	30 – 35	35 – 40	40 – 50	50 – 60	60 – 65	65 – 70
Number of students	5	.....	.....	10	4	2



i. Complete the table and complete the histogram accordingly.

ii. Draw the frequency polygon using the histogram.

iii. Find the total number of students of the group.

iv. If the students weight 65kg or more considered as over weight group, find the percentage of over weight group of students.

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இரண்டாம் தவணை மதிப்பீடு - 2016
Second Term Evaluation -2016

11 ශ්‍රේණිය தரம் 11 Grade 11	ගණිතය II පත්‍රය கணிதம் வினாத்தாள் - II Mathematics Paper - II	කාලය පැය තුනයි *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 a right circular cylinder of radius **r** and height **h** is $\pi r^2 h$.
- The volume of a sphere of radius r is $\frac{4}{3}\pi r^3$.

Part – A

- Answer **five** questions only

(01) Bimal invested Rs. 50000 to buy shares in a company A which pays annual dividends of Rs. 6 per share, at market price of Rs. 50 per share.

i. Find the annual dividends income he receives from company A.

At the end of one year, he sold these shares at the market price of Rs. 60 per share after receiving the annual dividends income. He invested the money received by selling shares and the annual dividends income received from company A, in company B which pays annual dividends of Rs. 7 per share for two years. He gained an annual income of Rs. 7700 from this investment.

ii. Find the capital gain received by selling shares of company A.

iii. Find the number of shares he bought from company B.

iv. If he deposited Rs. 66000 in an account at a compound interest rate of 10% per year for two years without investing in company B. Which is more profitable? Buying shares from company B or depositing money at a compound interest? Give reasons for your answer.

(02) An incomplete table prepared to draw the graph of the function $y = (x - 1)(x + 3)$ is given below.

x	-4	-3	-2	-1	0	1	2
y	5	0	-3	———	-3	0	5

i. Find the value of y , when x = -1

ii. Draw the graph of the above function using a suitable scale

Using the graph,

iii. Find the coordinates of the turning point.

iv. Find the roots of the equation $x^2 + 2x - 3 = 0$

v. If the coordinates of the turning point of the function $y + k = 0$ is (-1 , -6) find the value of k (y is the given function and k is a constant)

(03)

a) Simplify using the knowledge of factors.

i. $(3a + b)^2 - (3a - b)^2$

ii. Solve. $2(x + 2) + \frac{1}{3}(3 - x) = \frac{5}{2}$

b) A certain number of toffees are distributed among a group of students. If each child gets 8 toffees, 4 toffees are left and if each child gets 9 toffees 5 more toffees are needed.

i. Taking the number of toffees as x and the number of students as y, construct a pair of simultaneous equations containing x and y.

ii. By solving the equations find the number of toffees and the number of students.

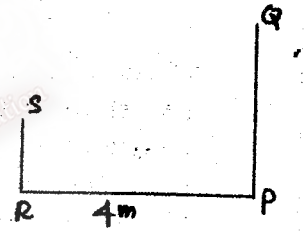
(04)

a) Sujith stands on a horizontal ground at R which is 4m away from a vertical flag post, observes the top of the flag post Q with an angle of elevation of 35^0 and the bottom of the flag post P with an angle of depression of 20^0. Given below is a sketch which is drawn to represent the above information.

i. Draw a scale diagram using the scale 2cm represent 1m according to the given information.

ii. Find the actual height of sujith in metres

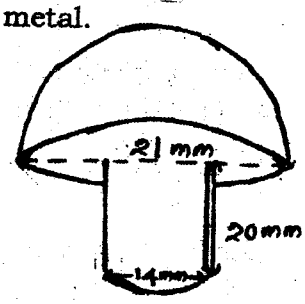
iii. Find the actual height of the flag post in metres.



b) A patient has been given saline at a rate of 0.5 millititres per second. Find the time taken to give 600 millititres of saline in minutes.

(05)

a) The diagram shows a nail made out of a right circular solid cylinder and a hemispherical part. A certain number of such nails are madeout of a metal with a volume of $550.55cm^3$. If the wastage is 15% of the volume when making nails, find the number of nails made out of metal.



b) Simplify using the logarithmic table.

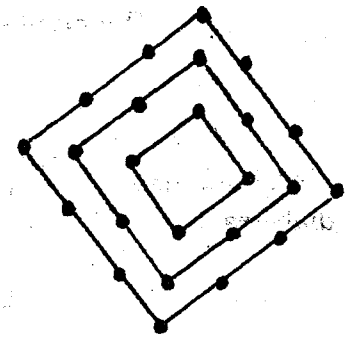
$\sqrt[3]{12.15} \times 0.714$

(06) In the triangle ABC , $\hat{ABC} = 90^0$, BC = (x + 2) cm , AB = (x – 1) cm and AC = 7 cm. Draw a diagram to represent the given information and find the length of BC to the nearest first decimal place. (Take $\sqrt{89}$ as 9.4)

Part - B

- Answer **five** questions only

(07) The figure shows a decoration of some small light bulbs have been connected to square shaped frames. 4,8,12, ... number of bulbs are fixed in to the frames in order.



i. If there are 12 such frames, show that the number of bulbs do not exceed 315.

ii. If it is needed to fix the bulbs in 8 frames of the sequence 4,8,16 ....., show that 708 more bulbs are needed to fix.

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

i. Contruct the right angled trangle ABC in which AB = 6cm, $A\hat{B}C = 90^0$ and BC = 5 cm

ii. Using the triangle ABC, find the nearest value for $\sqrt{61}$

iii. Construct a line parallel to AB through C and complete the rectangle ABCD.

iv. The interesting point of the perpendicular bisector of AC meets the line CD at O. Construct a circle passing through the points A and C by taking the center as O.

v. If the point where the circle meets the CD produced is E, write a relationship between $A\hat{O}C$ and $A\hat{E}O$.

(09) The following frequency distribution shows the data obtained about the number of motor cars that entered to the southern express way from Kottawa-Matara from 8.00 a.m. to 8.00 p.m. in a certain month

Number of motor cars	100 –110	110 –120	120 –130	130 –140	140 –150	150 –160	160 –170
Number of days	3	2	6	9	5	3	2

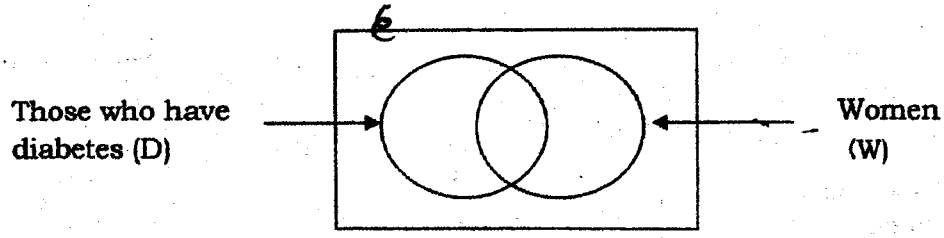
i. Write the class interval which belongs to the maximum number of days?

ii. By taking the mid value of the class interval 130-140 as the assumed mean, find the mean number of motor cars which entered to the express way to the nearest whole number

iii. A worker states that the number of motor cars entered to the express way exceeds 49000 within a year. Do you agree with him ? Give reasons.

(10) Given below are some information gathered about a group of 120 adults in a certain village.

- 25% of men have diabetes
- 20% of women have diabetes
- The number of women in the group is 64.



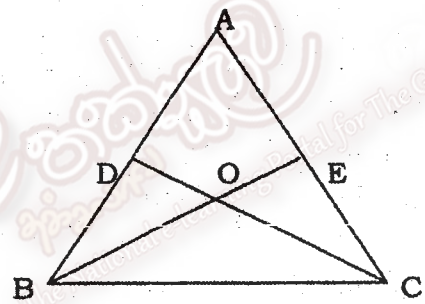
i. Copy the Venn diagram and complete it according to the given information.

ii. Find the number of men who have diabetes

iii. Find the probability of men who **do not have** diabetes

iv. Shade the region represent the women who do not have diabetes and write it in the set notation.

(11) In the triangle ABC, D and E are the mid points of the sides AB and AC respectively. The lines BE and CD intersect each other at O. The straight line through B parallel to CD meets AO produced at F. The lines OF and BC intersect at G.



i. Copy the figure and insert the given information

ii. Show that BFCO is a parallelogram

iii. Show that,
The area of the Parallelogram BFCO = 4 Area of Δ AOD

(12) In the triangle ABC, AB = AC. The perpendicular drawn from B to AC meets the circle which is passing through the points A , B and C at D. AD and CD are straight lines and BD and AC intersect at O.

i. Draw a figure according to the given information and prove that

$$B\hat{A}C = 2D\hat{A}C$$

ii. Show that,

$$\frac{AO}{OD} = \frac{BO}{OC}$$