Department of Education – Western Province Practice Paper
GCE (O.L) Examination – 2020
Mathematics 1 Duration: 2 Hrs
Instructions: ***Answer all the questions on this paper itself***

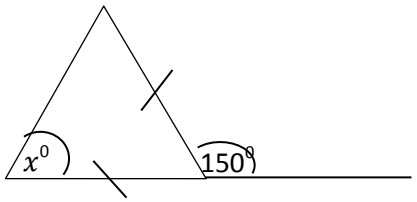
Part A

Questions from 1-25 carry 2 mark (1+1) each

01. The marked price of an article is Rs 30 000/= If 10% on marked price is levied as VAT, what is the selling price of the article inclusive of VAT?

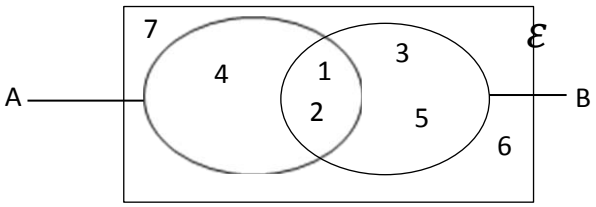
02. Solve for x, $(2x-1)(x+3)=0$

03. According to the information given, find the value of x in the illustration.



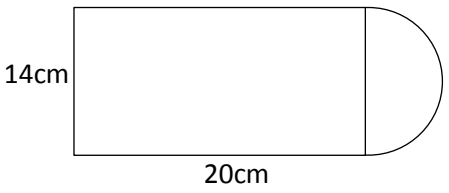
04. Simplify, $\frac{1}{3x}+\frac{1}{5x}$

05. In the Venn diagram given write down the set A'∩ B' element wise.



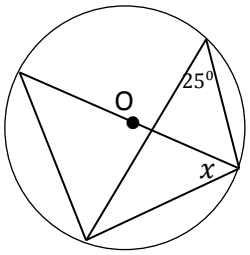
06. Find the LCM of the two expressions, $3ab, 6a^2$

07. According the given measurements in the illustration, which comprises of a rectangle and a semi-circle find the perimeter of the composite figure.



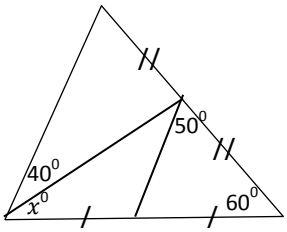
08. The stock of food available in a hostel is sufficient for 20 inmates for 7 days. If 8 more students are admitted to the hostel on the same day, how many days the stock of food available is now sufficient for all the inmates?

09. O is the centre of the circle shown.
Find the magnitude of the angle denoted by x



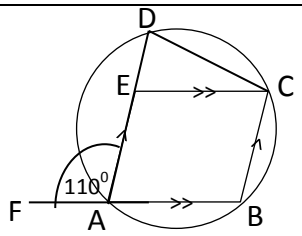
10. What is the gradient of the straight line which passes through the points with co-ordinates, (2, 3) and (4, 6)

11. According the given information in the figure, find the magnitude of the angle denoted by x



12. Two regular tetrahedral dice each carrying numbers from 1 to 4 on their faces are thrown together. What is the probability of obtaining two odd numbers on both dice?

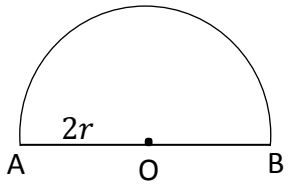
13. According to the information given, find the value of $D\hat{C}E$



14 If $A = \begin{pmatrix} 2 & 0 \\ -1 & 1 \end{pmatrix}$ and $B = \begin{pmatrix} 1 \\ 3 \end{pmatrix}$, find the matrix AB

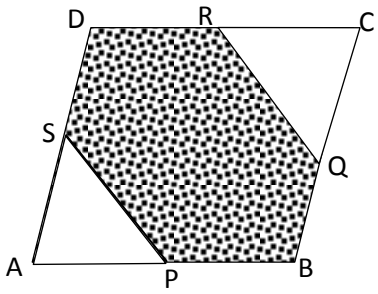
15. If $8.75 = 10^{0942}$, evaluate $\lg 875$

16. The picture shows a semicircular laminar with centre O and radius $2r$. The laminar is folded so that the side OA coincides with the side OB to form a right circular cone with O being its apex. Find the area of the curved surface of the cone so made in terms of π and r

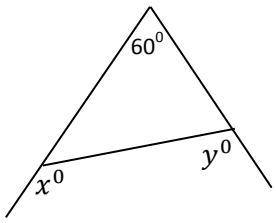


17. Factorise, $x^2 - 2ab + 2ax - bx$

18. P, Q, R and S are the mid points of the sides AB, BC, CD and DA of the given rhombus ABCD. The length of each side of the rhombus is 8cm and the diagonal, BD is 10cm long. Find the perimeter of the hexagon, PBQRDS

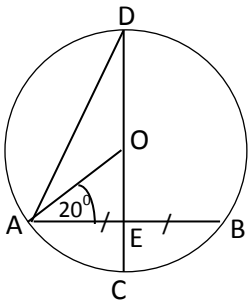


19. According to the information given, find the value of $x^0 + y^0$

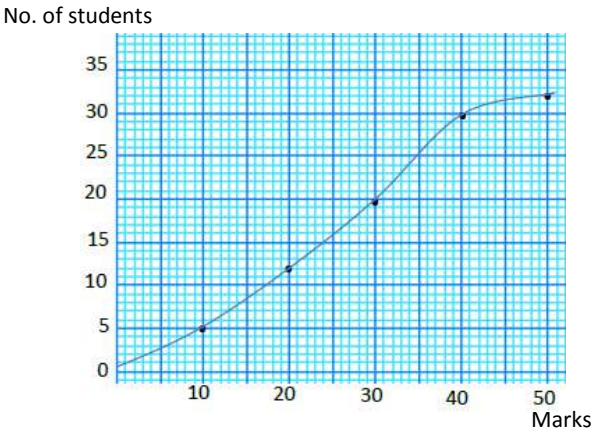


20. Find the 9th term of the geometric progression of which first term is $\frac{1}{8}$ and the common ratio is 2.

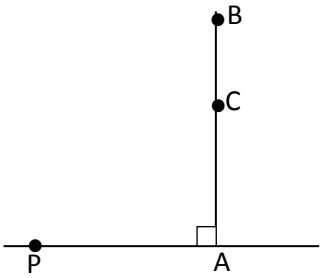
21 The picture shows a circle with centre O. Using the given information, find the value of $A\widehat{D}O$



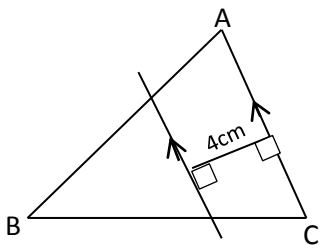
22. The picture shows a cumulative frequency curve of marks obtained by a group of students for a practical test. Find the inter quartile range of the distribution.



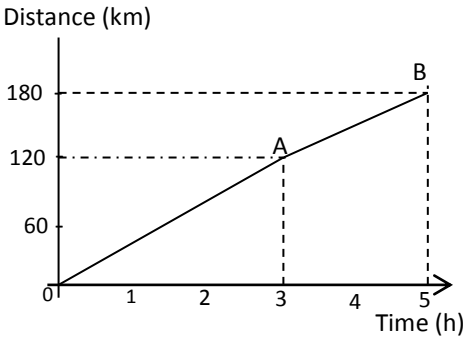
23. AB is a multi storey building. A person at point B sees a person at the point P with an angle of depression 60^0 and a person at point C in the building sees the person at point P with an angle of depression 40^0. Mark the given information on the illustration.



24. An incomplete construction work is shown here to locate the point which is equidistant from sides AB and BC of the ΔABC and 4cm away from the side AC. Draw a sketch to complete the construction to show the location of the point



25. The distance time graph of a vehicle travelling in an express way is shown here. Find the average speed of the vehicle.



Part B

Answer all the questions on this paper itself

1. In a certain school 150 students are going to sit the GCE (OL) examination this year. $\frac{1}{5}$ of them have selected the subject dancing and $\frac{3}{8}$ of the remaining students have selected the subject music.

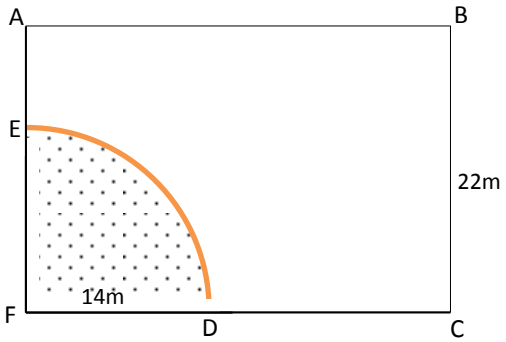
   i) What fraction of the students has selected subjects other than dancing out of whole students?

   ii) What fraction of students has selected music out of total students?

   iii) If all the other students who have not selected dancing and music have selected either art or drama, what fraction of the students has selected the subject art or drama out whole students?

   iv) If the number of students who have selected art was as two times as the dancing students, how many students have selected drama?

2. The picture shows a rectangular garden with a pond in the shape of a sector of a circle at a corner. Breadth of the land is 22m and the radius of the sector is 14m. Taking $\pi = \frac{22}{7}$



   i) Find the area of the pond.

ii) If the area of the garden without the pond is three times the area of the pond, find the length of the garden.

iii) Find the perimeter of the garden without the pond.

iv) If a flower bed with half the area of the pond is constructed inside the garden with BC being a boundary to it, find the breadth of the flower bed and draw a sketch of the flower bed showing it in the above illustration.

3. a) The table here gives information about the cost incurred in importing a motor vehicle.

Costing Category	Cost incurred
Import Price	Rs 800 000
Import Duty paid	Rs 400 000
Other Expenses	Rs 300 000

i) What is the percentage of import duty of this type of a vehicle?

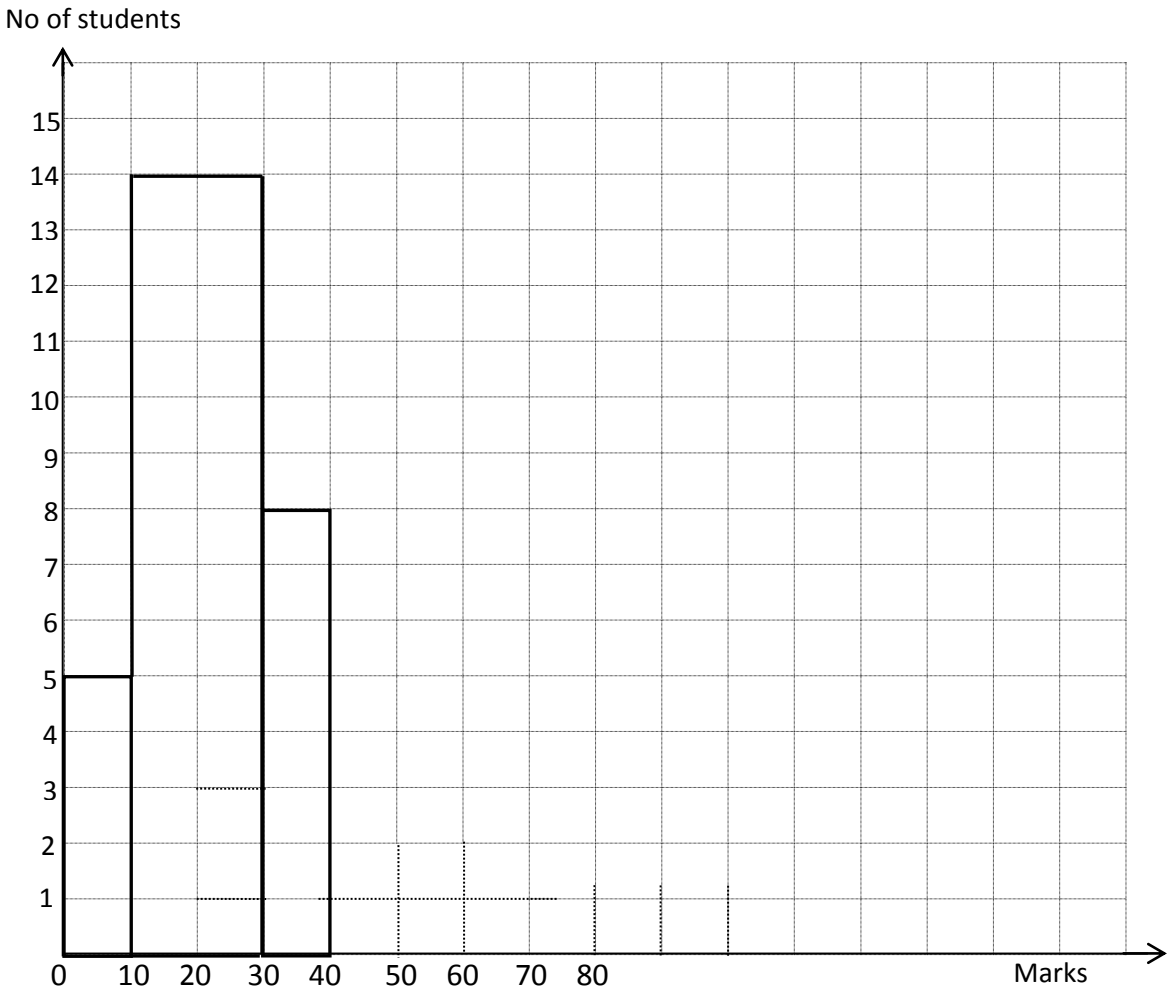
ii) How much should the importer sell this vehicle at to make a 15% profit?

b) An investor deposits Rs 350 000 for two years in a bank account which pays 12% compound interest per annum

i) End of the first year how much will stand in full in his bank account?

ii) How much will he receive in full after two years

4. a) The histogram shows, how a group of students obtained marks for a certain subject in a test.



i) How many students have obtained marks between 10 and 30?

ii) If 9 students have obtained marks between 40 and 70, denote this information in the histogram.

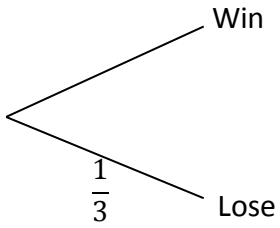
iii) Draw the frequency polygon on the completed histogram.

b) The mass of each student in a group weighed to the nearest kilogram is given below. Work out the interquartile range of the data.

28, 31, 33, 37, 37, 38, 39, 40, 40

5. a) A contender playing in a game can proceed to the second round only if he wins the first round of the game. The probability that he loses the first round is $\frac{1}{3}$. Any contender who wins the first round has a probability of $\frac{3}{5}$ to win the second round too.

i) Complete the given tree diagram pertaining to the first round of the game by writing the appropriate probabilities.

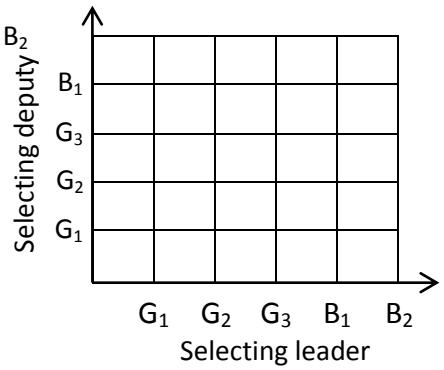


ii) Extend the above tree diagram to the second round and mark the relevant probabilities on the respective branches.

iii) What is the probability that a randomly selected contender wins both rounds?

b) Among a group of children which comprises of 3 girls and 2 boys, one child is selected at random as the leader. The deputy is selected from the remaining children at random.

i) Complete the following grid representing the total sample space of the event with marks "×". G_1, G_2 and G_3 represent girls and B_1 and B_2 represent boys in the group.



ii) Highlight the event in the grid that represents a boy being selected as the leader and find its probability.

iii) Find the probability that a girl is selected for one post.

Department of Education – Western Province

GCE (O/L) Examination – 2020

Practice Paper

Subject: Mathematics 11	Extra Time: 15 minutes	Time: 3 hours

Use the extra time to read the paper and select questions of your choice and to organize the priority order of answering the selected questions

Important:

- Answer ten questions selecting five questions from Part A and five questions from Part B
- Write down the appropriate steps and units in answering questions
- 10 marks each for all the questions
- The volume of a right circular cylinder with base radius $\boldsymbol{r}$ and the height $\boldsymbol{h}$ is $\pi r^2 h$
- The volume of a sphere of radius r is $\frac{4}{3}\pi r^3$

Part A

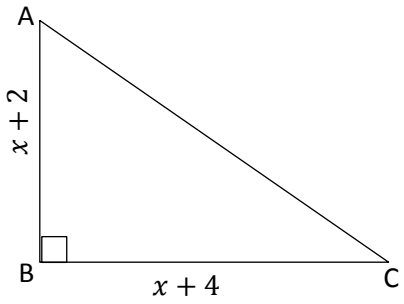
Answer five questions only

1) a) Nuwan invested Rs 60 000 to buy shares each at Rs 20 in a company which pays annual dividends of Rs 8 per share. One year after he received his dividends he sold all the shares and earned a capital gain of Rs 15 000.

   i. How many shares did he have in the company?
   ii. What was his dividend income in the company end of the year?
   iii. End of the year what price did Nuwan sell each share at?

   b) After an year, Nuwan invested a certain amount of money in a financial institute which pays 10% simple interest per annum. If he earned Rs 10 000 as total interest after 2 years of investment, how much did Nuwan invest in the financial institute?

2)



The area of the given right angled triangular laminar is 6cm^2. According to the given dimensions of the triangle,

a) Show that the value of x agrees with the equation, $x^2 + 6x - 4 = 0$.

b) Solve the equation for x either by completing the square or by any other method.
(use $\sqrt{13} = 3.61$)

3) An incomplete table of values of x and y is given below to draw the graph of the function, $y = 2 + 4x - x^2$

x	-1	0	1	2	3	4	5
y	-3	2	5	……	5	2	-3

i. Find the value of y when $x = 2$.

ii. Draw the graph of the given quadratic function on the standard coordinate plane of a graph paper selecting a suitable scale.

iii. Using the graph, find the range of x for which $y \geq 1$

iv. If the above quadratic function of x is given as, $y = k - (x - 2)^2$ find the value of the constant k.

v. Using the graph find the values of x, when $y = 0$, hence obtain the value of $\sqrt{6}$ to one decimal point.

4) In order to do a certain activity in mathematics, Kavindi has prepared 47 identical sticks with equal lengths. She prepared 11 regular pentagons and equilateral triangles in total using all the sticks.

i. Buildup a pair of simultaneous equations taking the number of pentagons and number of equilateral triangles prepared as x and y respectively.

ii. Solving the simultaneous equations find the number of pentagons and triangles she prepared separately.

iii. If Sansala who too was involved in the same activity has prepared $'a'$ number of pentagons and if that number agrees with the inequality, $\frac{1}{2}a - 5 + 2a \leq 2$, find the maximum number of regular pentagons she could prepare.

5) A right circular cylindrical shaped metal rod with radius, $2a$ and length l is melted and recast into 25 solid metal spheres each with radius a without wastage of material.

i. Show that the length of the rod, $l = \frac{25}{3}a$

ii. If $a = \sqrt{2}$ units, obtain the value of l to the nearest decimal number using logarithm tables.

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6) The following frequency distribution shows information about the daily income (to the nearest rupee) in 20 days of a grocer who runs a telephone booth in his compound.

Income (Rs)	100 – 140	140 – 180	180 – 220	220 – 260	260 – 300	300 – 340	340 – 380
No of days	1	3	4	5	4	2	1

i. Estimate the mean daily income in the booth to the nearest rupee,

ii. An employee working in the booth is paid Rs 5000 monthly by the grocer and also spends Rs 1 800 monthly for the maintenance of the booth. Workout his monthly (in 30 days) profit/loss in the business

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Part B

Answer five questions only

7) a) The first term and the seventh term of an arithmetic progression are 3 and 27.

i. What is the common difference of the progression?

ii. Which term of the progression is 59?

iii. What is the sum of the first 15 terms of the progression?

b) In a quiz competition, the price money for the successful answer of the first question is Rs 100 and thereafter the price money for every preceding question is two times the money paid for the previous question and so on. The total number of questions presented is 8.

What is the total price money a contender will receive for the successful answering of all 8 questions?

8) For the following construction given, use only a pair of compasses and a ruler with mm/cm scale and show all the construction lines clearly.

i. Draw a straight line segment of length 7.5cm and name it as AB.

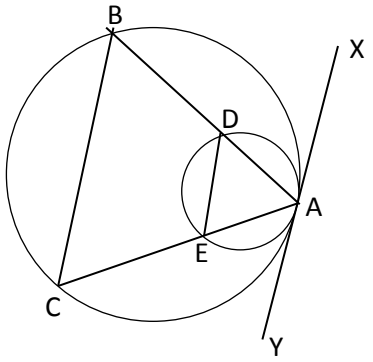
ii. Construct the circle to which AB is a diameter.

iii. Obtain the location of the point P such that AP = 6cm and $A\widehat{P}B = 90^0$ and measure the length of PB.

iv. Obtain the point Q on the line drawn through P parallel to BA which meets the circle at Q such that $P\widehat{A}B = P\widehat{Q}B$.

v. Construct a tangent to the circle at Q

9)

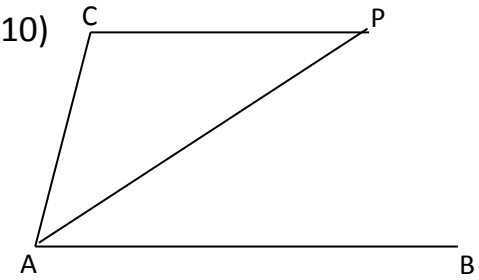


The smaller circle touches the larger circle inside of it at the point A as shown and the tangent XAY is drawn common to both circles at A. The two chords AB and AC intersect the smaller circle at D and E.

i. Show that ΔABC and ΔADE are equiangular.

ii. If DB = 2 AD, show that BC = 3 DE.

10)

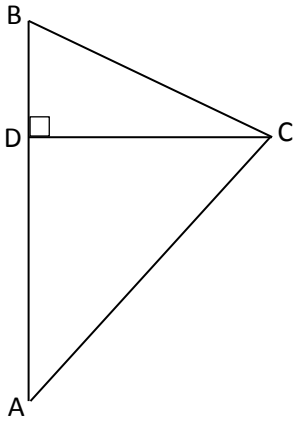


AP bisects the angle $C\widehat{A}B$ in the picture and AC = CP.

i. Copy down the illustration onto your answer script and mark all the information given on it and show that AB // CP.

ii. The bisector of $A\widehat{C}P$ meets AP at Q and AB at R. Prove that $\Delta\, ACQ \equiv \Delta PCQ$

iii. If CQ = QR, show that quadrilateral ARPC is a rhombus.

11) 

In the picture given, points A, B, C and D are located on the horizontal ground. AB is a straight line such that B is due north of A. The bearing of C from B is 110^0 and C is 60m away from B.

i. Copy down the illustration onto your answer script and find the magnitude of $C\widehat{B}D$.

ii. If CD is perpendicular to AB, using trigonometric tables calculate the length of CD to the nearest metre.

iii. If the distance between D and A is 100m, calculate the bearing of C from A.

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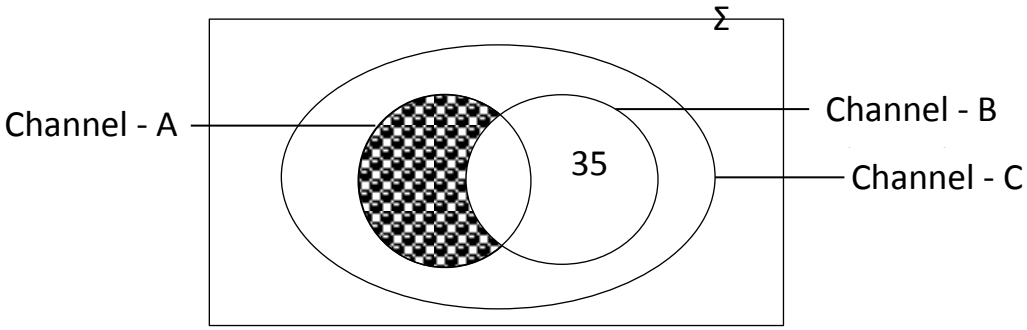
12) The information reveled in a survey done among 200 television spectators about their watching of three TV channels A, B and C is given in the following incomplete Venn diagram.



i. Describe in words the shaded region in the Venn diagram.
ii. If 50 people watch Channel- B, how many people watch all 3 channels?
iii. If 80 people watch none of the above channels, how many people watch channel-C?
iv. If 65 people watch channel-A, how many people watch only one channel?
v. But it was later revealed that there were 2 people who watch only channel A. Hence draw a new rectified Venn diagram to include revised information.

-End-

Translated by: Anura Jayatillake