Grade
11

THIRD TERM TEST - 2018

SUBJECT - **Mathematics -I**

School : ....

Name of the Student/ Index No : ....

....
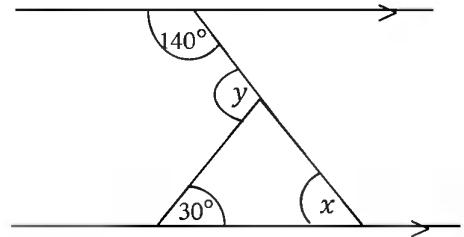
Time: 2 hr.

Part - A

❖ **Answer all the qnestions on the paper itself.**

1) When buying an item, 15% of VAT is added. Find the amount of VAT when buying an item for Rs. 20 000.

2) Express $5^4 = 625$ in logarithmic form

3) According to the information given in the figure,
   i.   Find the value of x
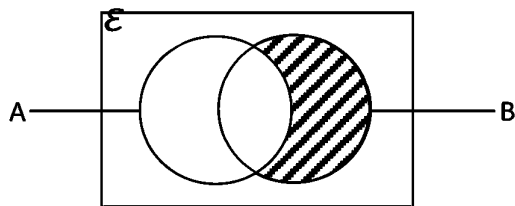   ii.   Find the value of y

4) It takes 6 days to complete a certain task by 5 men. Find the number of days needed to complete the half of the task by 3 men.

5) Underline the co-ordinates which satisfy both inequalities $x < 2$ and $y < x$.

   I.   (1,0)   2. (-2,2)   3. (2,0)   4. (-I,-2)

6) Simplify $\dfrac{4y}{5xy} \times \dfrac{10x^2 y}{3}$.

7)

Describe the shaded region in words.

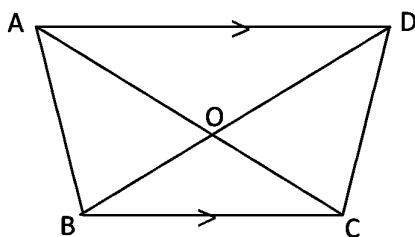$\mathcal{E}$ = { Students of Grade I0 }
A = { Students who study Music }
B = { Boys }

8) Find the least common multiple of $4x^2 y$ and $8xy'$

9) 10 identical cards which are numbered are given below.

| 5 | 1 | 4 | 4 | 2 | 3 | 5 | 2 | 4 | 3 |

  Find the probability of getting number 4.

10)

According to the information in the figure"
    i.   Name a triangle equal to the area of the triangle BCD'
    ii.   Name a triangle equal to the area of the triangle ABO'

11) If the interquartile range is 8 and the first quartile is 3 of a group of data, find the third quartile of them.

12) Underline the value which is approximately equal to the expression $\sqrt{3} \times \sqrt{4}$

    1. 3.4   1. 12   3. 2.3   4. 3.0

13) The area of the cross section of the prism is $24 cm^2$ and its volume is $240 cm^3$, find the length of the prism.


$24 cm^2$ l
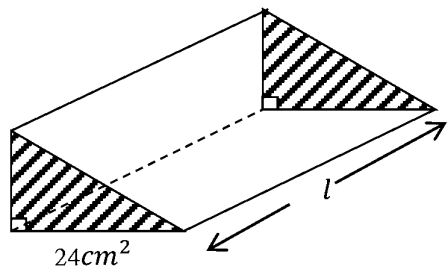
14) Two factors are shown in the diagram which are needed to show that the triangles ABC and PQR are congruent. Select the remaining equal pair of components of two triangles and put a tick in the relevant box.

  i. $A\hat{B}C = P\hat{R}Q$ ☐

  ii. $C\hat{B}A = R\hat{Q}P$ ☐

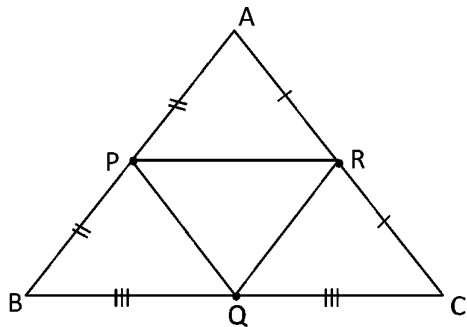 iii. $A\hat{C}B = R\hat{P}Q$ ☐

  iv. $AC = PQ$ ☐
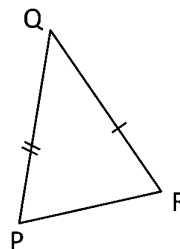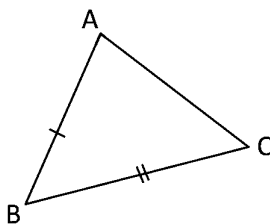
15) A and B are two locations on the horizontal ground. The point A is observed from window C at the angle of the flat which is on point B depression 42°,
AB = 20. Include the above data on the given incomplete diagram.
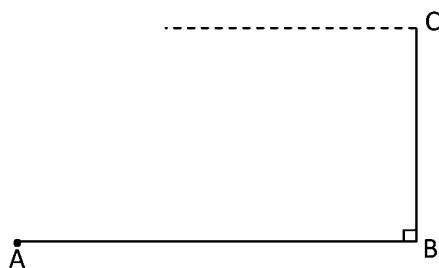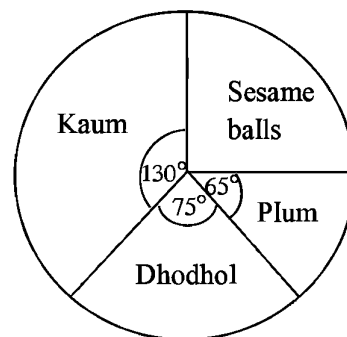

16) Solve $2 - \frac{x}{3} = -1'$

17) The perimeter of the triangle PQR is 18cm. Find the perimeter of the triangle ABC'

18) The pie chart shows how sweets were sold in a sweet shop in a certain day. Find the angle at the center of the sector of sesame balls.

19) Write the equation of straight line which passes through the point (0 , -3) and parallel to the line $y = 3x + 5$.

20) The radius of the semi circular figure of centre O is 14em. Find the area of the shaded region.
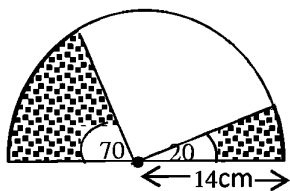
21) In the circle of centre O, P, Q, R and S are four points on the circle.

According to the information given in the figure,
   i.   Find the value of a.
   ii.   Find the value of b.

22) ABCD is a parallelogram. The bisectors of the angles $A\hat{D}C$ and $B\hat{C}D$ meets at X on the line AB. Find the Magnitude $D\hat{X}C$.
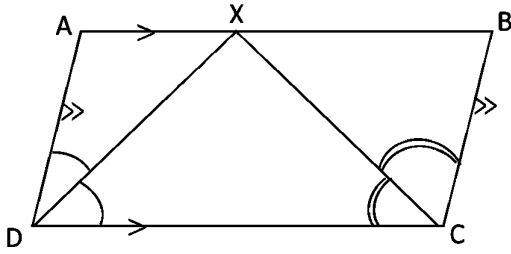
23) In the diagram, If $\cos\theta = \frac{5}{13}$ Write the ratio for $\tan\theta$.
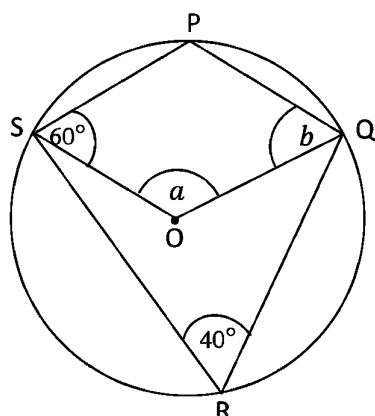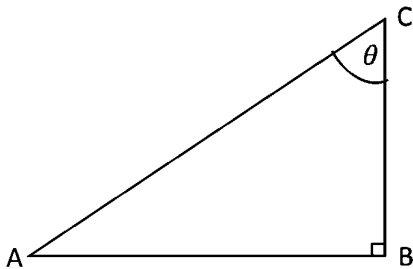

24) The center of the circle given in the figure is O. OABC is a parallelogram. DCB is a straight line. If $A\hat{B}D=40°$ Find the magnitude of $B\hat{A}D$.
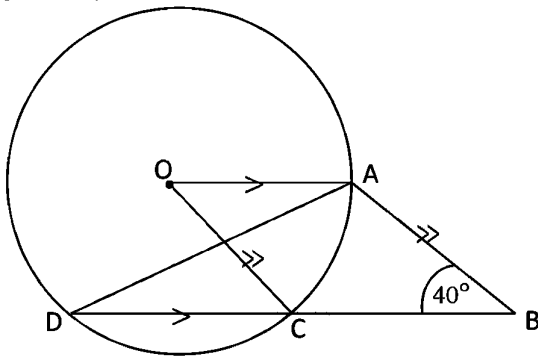
25) The following sketch shows AB horizontal road and a power post M, 8m away from the road. Using the knowledge of loci , represent the way of finding the points 10m away from the point M on the road A B.
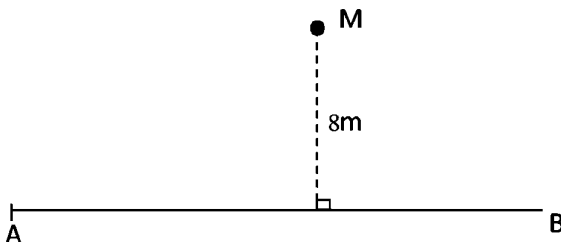
❖ **Answer all qnestions.**

1.) The rural development society decides to separate $\frac{2}{5}$ of an amount for repairing the building, $\frac{1}{4}$ of an amount for welfare of members and $\frac{1}{7}$ of the remainder for charity in a certain year.

   i. Find the total amount separated for repairing building and welfare as a fraction from the whole amount.
(02 mark)

   ii. What is the amount separated for charity as a fraction of the whole amount (02 mark)

   iii. If the remaining amount is Rs 24 000, find the total amount received by the society. (03 mark)

   iv. If $\frac{1}{4}$ of the amount separated for welfare is to be added to the amount separated for charity due to a suggestion, find the total amount separated for charity. (03 mark)

2.)
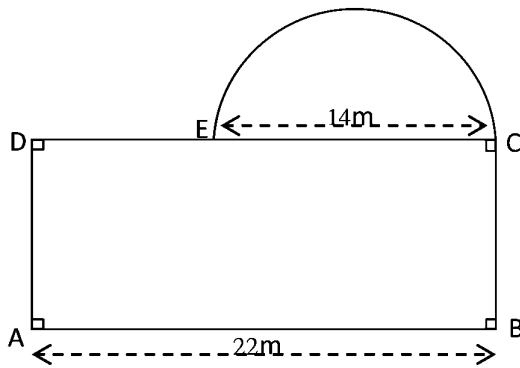
The diagram shows a ABCD rectangular shaped land. The length of it is twice the breadth. The semicircular portion of which the diameter is ^CE& = 14m is connected to the land.

i.   Find the breadth of the rectangular shape land.   (01 mark)

ii.   Find the area of the rectangular shaped land.   (02 mark)

iii.   Vegetables are grown in the scmicircular shape land. Find the length of the curved boundary of the semicircular land.   (02 mark)

iv.   A fence is to be arranged around the had which vegetables are grown. If the fence is arranged heaping 2m gaps betwcen two posts, Find the number of posts needed.   (02 mark)

v.   The owner of thc land decided to separate a right angled triangular shaped part form the land which the area is cqual to the semicircular shape land such that AD and AB are boundaries. Draw the part of thc land with measurements in the above diagram.   (03 mark)

3.) The incomplete table and histogram are prepared using data of selling milk powder packets in a certain shop of last month April.

Number of milk powder packets sold	40-50	50-60	60-80	80-110	110-120
No of days	3	....	....	9	2
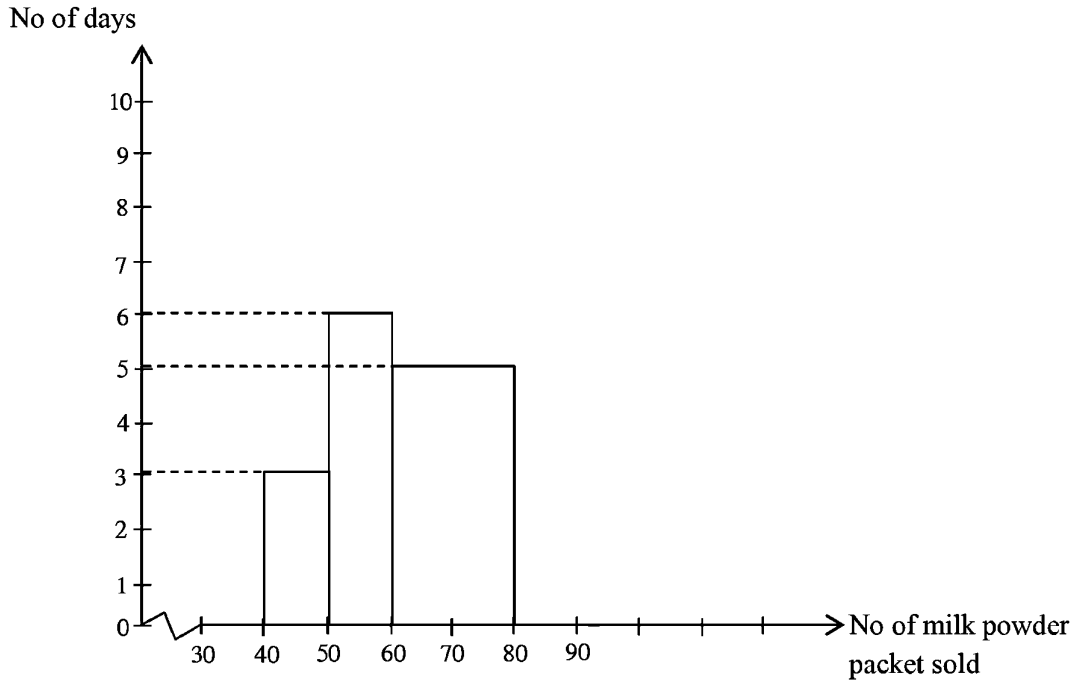
No of days

i.   What is the number of milk powder packets sold during this month?

(01 mark)

ii.   Fill in the blanks of the table.

(02 mark)

iii.   Complete the histogram   (02 mark)

iv.   Draw the frequency polygon using the above histogram.

(03 mark)

v.   Express the number of days which are sold less than 60 milk powder packets as a percentage.

(02 mark)

4.) when a certain type of motorcycle is imported, the government charges a duty of 20% . After paying the duty the value of a motorcycle is Rs 240 000.

   i.   Find the price of the motorcycle before paying the duty tax.   (02 mark)

   ii.   The transport cost and other expenditure for a motorcycle is Rs 4000. Then the seller marks the price of a motorcycle keeping a profit of 5%. Find the marked price of a motorcycle.   (03 mark)

   iii.   When selling a motorcycle on cash price, a discount of Rs 2562 is reduced. Find the percentage of the discount.   (02 mark)

   iv.   If the seller sells 20 motorcycles in a certain month, find the profit he received   (03 mark&

(05). a). There are 2 red bulbs, 3 blue bulbs in a box. All are identical bulbs. A bulb is taken out randomly without putting it in to the box another bulb is taken out.

   i.   Show the sample space of selecting two bulbs in the grid.   (02 mark)

2st taken

1st taken
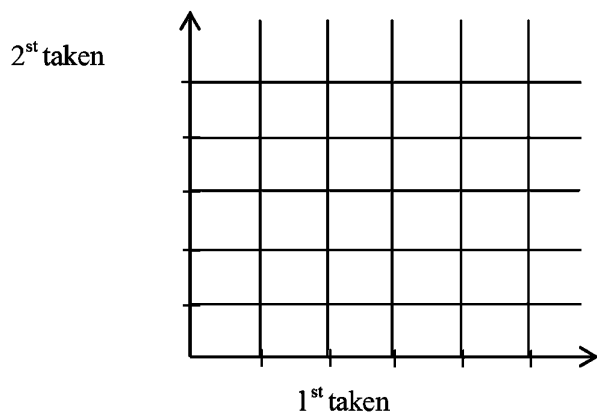
   ii.   Encircle the elements of taking same color bulbs in both time.   (01 mark)

b). The incomplete tree diagram of taking the first bulb is as follow.

```
            Red
  .............  /
            /
          /
        /
  ............  \
            Blue
```
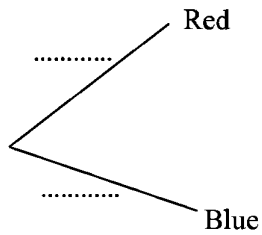
    i.   Complete the tree diagram.   (02 mark)

   ii.   The probability of lighting a red bulb is $\frac{7}{8}$ and the probability of lighting a blue bulb is $\frac{1}{5}$. Extend the tree diagram according to above statements.   (02 mark)

  iii.   Find the probability of lighting a selected bulb.   (03 mark)

Third Term Test-2018

Grade 11

Mathematics -II

Name/Index nnmber...

Time : 3 hours

School...

- ❖ **Answer 10 questions by selecting 5 questions from Part A and 5 questions from Part B.**
- ❖ **Each qnestion carries 10 marks.**
- ❖ **The Volume of a right cylinder of a radins r and height h is $\pi r^2 h$.**

Part - A

(01) Mr. Gajanayake received an amount of Rs. 900 000 of his retirement. He deposited $\frac{1}{3}$ of it in a bank account for his needs.

    i.   Find the amount he deposited in the bank.   (1 mark)

           After depositing the money in the bank, the remaining amount of money was invested in a company where the market price of a share is Rs.25 each and Rs. 2 is given annually per share as the dividend. After receiving dividends for an year, he decided to sell all the shares at Rs. 26 per share.

    ii.   What is the dividend income received by him investing in the company?   (3marks)

    iii.   Find the capital gain he received by selling the shares.   (1mark)

    iv.   Find the total amount of income he received from the capital gain and dividend income after one year.   (1mark)

    v.   Mr. Gajanayake's brother says that if he deposited the money spent to buy shares in a bank as a fixed deposit account for senior citizens, he could have gained extra amount of Rs.18 000 than the total income he got(as in answer iv) at the end of the year selling shares and dividend, what is the annual interest rate given by the bank?

                                   (04 marks)

(02) An incomplete table of drawing the graph of the function $y = -x^2 - 4x + 2$ is given below.

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

    i.   Find the values of y when $x = -2$ and $x = 0$. Draw the graph of the function taking 10 small divisions along both x and y axis as 1 unit and then using the co-ordinates of the maximum point. Write the function according to the form of $y = k - (x + h)^2$. (k and h are constants)

                                     (07 marks)

    ii.   When $\sqrt{6} - 2$ is given as a root of the equation $x^2 + 4x - 2 = 0$, Find the value of $\sqrt{6}$ to the nearest first decimal place using the graph.   (03 mark)

(03) The following table shows the number of American dollars exchanged by a financial institute during a month.

Number of dollars	Number of days
50-75	2
75-100	4
100-125	8
125-150	10
150-175	2
175-200	4

i.   By taking the mid value of the model class as the assumed mean or otherwise, find the number of American dollars exchanged in a day to the nearest whole number.   (05 marks)

ii. If the rate of exchange in that month is a fixed value of Rs 160 for a dollar during that month, find the total amount issued for American dollars in Rupees by the institute.   (2 marks)

iii. When exchange a cheque of 1500 American dollars by Nuwan, he received Rs 255 000 in first week of the next month. Express the fluctuation of the value of the dollar as a percentage in that month.   (03 mark)

(04) Diagram shows a vertical building and a vertical tower CD situated on a horizontal ground 40m away from each other.
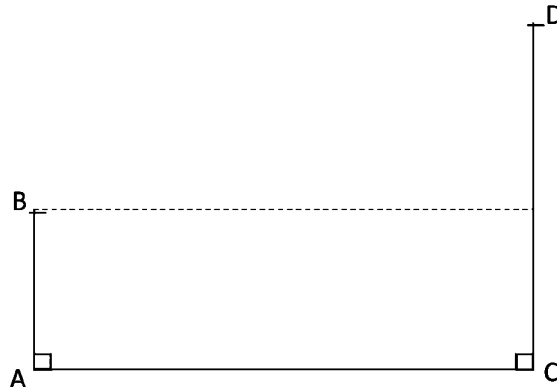
The bottom of the tower C is observed from the top of the building B with an angle of depress of 32° 30$'$ If the height of the tower CD is 39.6m, include the above data in the diagram by joining the necessary points. Find the magnitude of the angle of elevation when the point D is observed for the point B.

(10 marks)

(05) ABCD is a rectangular shaped thin iron plate. The shaded triangular shaped portion ADE is removed from the iron plate. The area of the remaining ABCE part is $7m^2$.
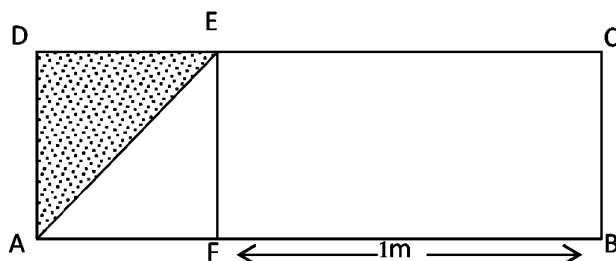
i. If the length of AF is x meters. Write an expression for the area of the remaining portion of the iron plate. (02 marks)

ii. Obtain the equation $x^2 + 2x - 14 = 0$ and show that $-1 \pm \sqrt{15}$ as the solutions. (03 marks)

iii. By selecting the suitable solution for the length of AF, Express AD and AB in terms of $\sqrt{15}$. (02 marks)

iv. Show that the area of the plate ABCD is $(15 - \sqrt{15})$ and by taking $\sqrt{15} = 3.87$ Find this area in square meters to the nearest second decimal place. (03 marks)

(06) (A) Pawan and Sahan are twin brothers. A certain amount of money was received by them for their 16th birthday, while a $\frac{1}{2}$ of the amount which was received by Pawan and $\frac{1}{3}$ of the amount received by Sahan was spent to buy two T-shirts and the total amount they spent is Rs 1200 . Then they spend the total remaining amount they have got, to buy 2 trousers Rs 900 each.

i. Build up a pair of simultaneous equations taking the amount received by Pawan as Rs x and taking the amount received by Sahan as Rs y. (02 marks)

ii. Solve the above equation and find the amounts received by Pawan and Sahan separately. (04 marks)

(B) If $B = \begin{pmatrix} 2 & 3 \\ 4 & 6 \end{pmatrix}$ and $A = \begin{pmatrix} 4 & 3 \\ -2 & -1 \end{pmatrix}$

i. Show that $BA = B$. (02 marks)

ii. If $A + 2I = C$ find the matrix C. I is an unit matrix in the order 2×2 (02 mark)

Part - B

(07) (A) In an arithmetic progression, the first term is 27 and the last term is 59. The sum of 4th and 6th terms is 86.

i. Find the common deference of the arithmetic progression. 03 marks

ii. Find the number of terms in the progression. 02 marks

iii. Find the sum of all terms of the progression. 02 marks

(B) When the first term is $\frac{a}{40}$ and common ratio is $2a$ of a geometric progression, show that the seventh term is $\frac{8a^7}{5}$ 03 marks

(08) Use only a straight edge of cm/mm scale and a pair of compass only construct the following. Show the construction lines clearly.

    i.   Construct the triangle ABC such that AB= 8cm, $B\hat{A}C$= 60° and $A\hat{B}C$= 30°   **03 marks**

    ii.   Construct the circumcircle of the triangle ABC and name its center as O.   **02 marks**

    iii.   Name the intersection point of the perpendicular bisector of AB and the side BC as E and name the intersection point of OE and AC as produced as D.

                                                                                                     01 mark
    iv.   Construct two tangents to the circle from the point D.   **02 mark**

    v.   Name which type of quadrate AOEC is? And write the theorem you use to decide it briefly.   **02 mark**

(09) A solid is prepared by removing a hemispherical part of radius r. from the cylinder base radius r and the height 3 times as its base radius. The symmetrical axis of hemisphere and cylinder are coincide each other. If the volume of the solid made is v,

- Show that $r^3 = \dfrac{3v}{7\pi}$ and find the value of r^3 to the nearest whole number using logarithm tables.

- Find the value of r.

   (7π =21.98 , v =468.91)
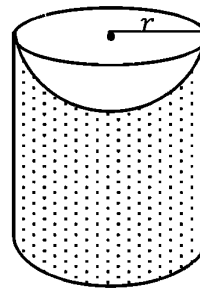
(10) In the triangle ABC, the midpoint of BC is D. The perpendicular drawn from A to BC is AH. The line drawn parallel
    to AB through C meet produced AD at E.
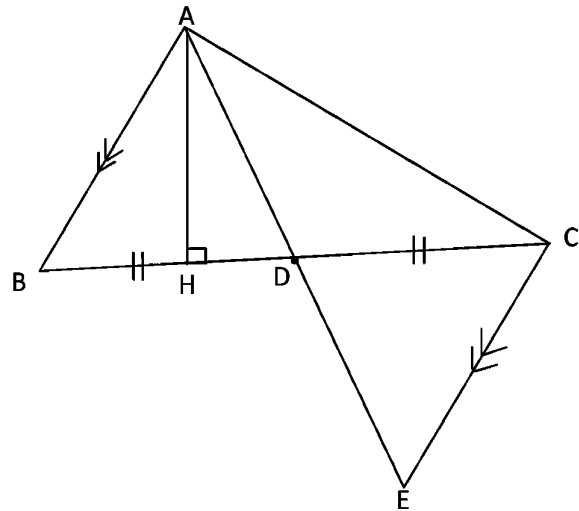
  i.   Prove that AB = CE.   **04 marks**
    ii.   Prove that ABCE is a parallelogram.   **02 mark**
    iii.   Show that $AC^2 = AD^2 + CD^2 + 2HD . CD$.   **04 marks**

(11) O is a point the side BC in the triangle ABC. The tangent drawn to the circle at B which passes AOB and the tangent which is drawn to the circle at C meet at X. Show that $A\hat{C}X + A\hat{B}X = 180°$ and A , B, X, C lie on the circle.

   (Consider $B\hat{C}X = y$ and $C\hat{B}X = a$)   10 marks
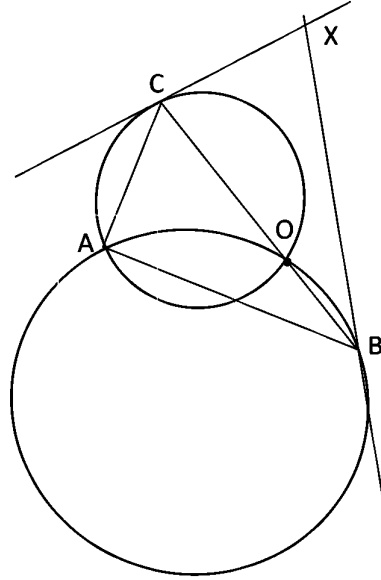
(12) (A) In a survey of 45 students of a higher education center, 20 students have motorcycles and 30 students have computers. All students who have motorcycle and the students who have computers, have mobile phones. 5 students have only mobile phones and 4 students do not have mobile phones.

   i.   Draw a Venn diagram and write the number of elements in each set.   05 marks

   ii.   How many students have computers but do not have motorcycles.   01 marks

   (B) 40 students have completed their course successfully out of above 45 students in the higher education center. 4 of them who have merit passes were appointed as instructors of the education center. If a student is selected randomly from the above students,

   i.   Find the probability of selecting a student who does not complete the course successfully.   01 marks

   ii.   Find the probability of selecting a student who is appointed as an instructor.   03 marks