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R/Sivali Central College

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Second Term Test Grade 11 - 2025

ගණිතය I
Mathematics I

පැය දෙකයි
Two hours

Index Number :- ....

Certified correct

....
Signature of invigilator

Important:

- This question paper consists of **8** pages.
- Write your **Index Number** correctly in the appropriate places on **this page** and on **page three**.
- Answer **all** questions **on this question paper itself**.
- Use the space provided under each question for working and writing the answer.
- Indicate the **relevant steps** and the **correct units** when answering the questions.
- Marks are awarded as follows:
  In Part A
  2 marks for each question
  In Part B
  10 marks for each question
- Blank papers can be obtained for scratch work.

For Marking Examiners' Use Only

Part	Question Numbers	Marks
A	1 - 25	
B	1	
	2	
	3	
	4	
	5	
Total		

.... First Examiner	.... Code Number
.... Second Examiner	.... Code Number
.... Arithmetic Checker	.... Code Number
.... Chief Examiner	.... Code Number

[Prepared by: R/Sivali Central College]

Part A

Answer all the questions.

01. Based on the information given below, select the pair of values that suitable for "a" and "x"

- log_x a = -2 $\longleftrightarrow$ $5^{-2} = 0.04$

i. a = $\frac{1}{25}$, $x = 5$

ii. a = $-\frac{1}{5}$, $x = 5$

iii. a = 5 , $x = \frac{1}{25}$

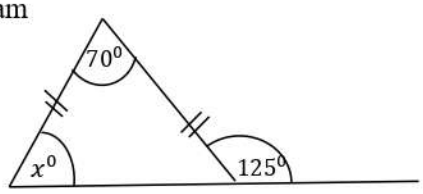
iv. a = 25 , $x = 5$

02. Fill in the blanks using the numbers with in brackets

$\sqrt{4} < \sqrt{7} < \sqrt{9}$

2 < ..... < 3 (2.1 , 2.6 , 2.5 , 2.9)

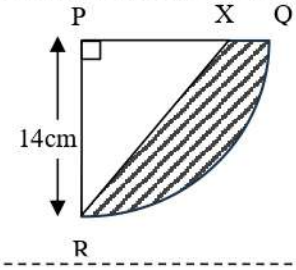
03. Find the value of x according to the information given in the diagram



04. To dig a drain, 3 men take a certain number of days. If the length of the drain is doubled to takes 48 days. How many days did it take to dig the original drawn.

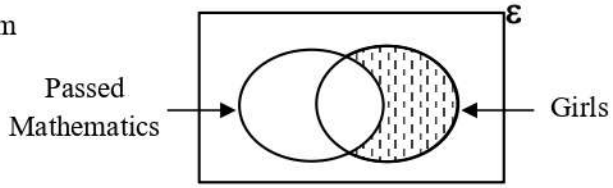
05. Simplify $\frac{2}{9at}$ x $(-6a^2)$

06. In the given figure, PQR is a sector of a circle. The area of that sector is twice the area of the shaded region. According to the given information find the area of PRX triangle.



07. Find the L.C.M. of $x(x-1)$ and $(1-x^2)$

08. Describe the shaded region in the given venn diagram



09. A water tank with a capacity of 1000l is emptied at a rate of 13 liters per minute because of a leakage of the tank After repairing that leakage 480 liters of water remained in the tank. For how long was the leakage occur?

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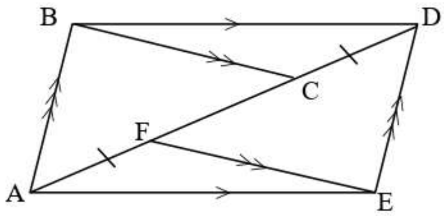
10. 

According to the given information mention which pair of triangles are the congruent under which case

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11. From the data given below find out 1st quatile (Q1) 3rd quatile (Q_3) and the Inter Quatile Range

3 , 6 , 6 , 7 , 8 , 8 , 9 , 11 , 11 , 12 , 15

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12. Solve the given inequality and represent the solution on a number line

$$x - 2 > \frac{3x - 1}{2}$$

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13. The selling price of an imported television is Rs: 80 000 A value added tax (VAT) of 15% is payable on the purchase of the product Find the value of the television with VAT.

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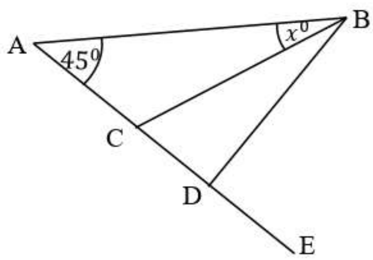
14. In the given diagram BC is the angle bisector of $A\hat{B}D$ Mention the value of the angle BDE in terms of x



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15. Write the fourth term of a Geometric progression whose first term is 8 and the common tatro is 5, as a power of ten.

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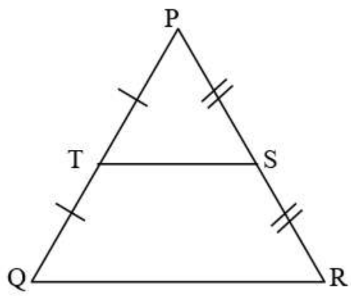
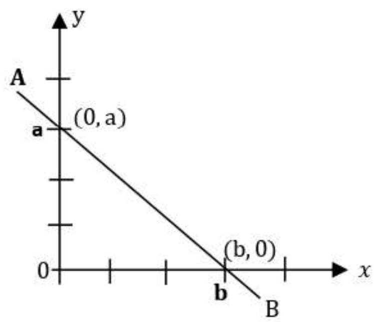
16. Solve ; $\frac{3x-1}{5} = \frac{x+1}{2}$

17. Factorize; $8x - 20 + x^2$

18. In the diagram, ST = 62cm and QR = ($5x$-1) cm. S and T are mid points of PR and PQ respectively. Find the value of x



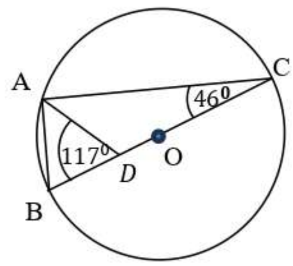
19. y = -2x + 4 is the equation of the AB straight line
Find the values of "a' and 'b'



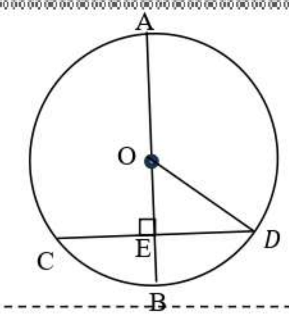
20. If the probability of getting a black colour ball from a bag containing only black and white balls is 'P'. Show that probability of not getting a black colour ball in both instances when a ball replaced after the first drawn

21. Solve; $3 \text{ x } 9^{(2x-1)} = 27$

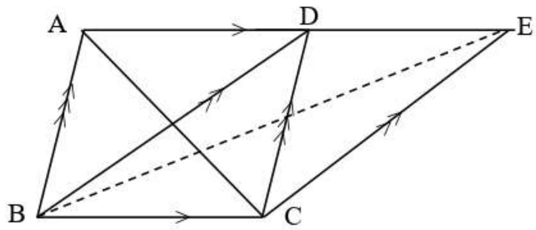
22. In the given diagram the O is the center of the circle.
Find the value of $B\widehat{A}D$ according to the geven information.



23. In the given diagram "O" is the center of the circle. If the length of the diameter AB is 30 cm and CD = 24cm, find the length of EB

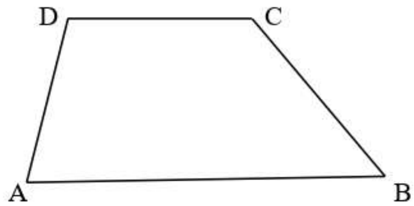


24. If area of the ABCD parallelogram is 18 cm^2,
Find the area of AEC triangle



25. In the figure, ABCD is a quadrilateral and the point R is constructed according to the following conditions.
- R is equidistant from to CD and should be located on AB
- R is equidistant from CD and BC

Based on the given information and using the knowledge of loci mark point P on the figure



Part B

01. The owner of a concreate construction station worked 4 days to complete a certain order related to cement bricks. On the first day $\frac{1}{6}$ of the total cement bricks was produced, and on the second day $\frac{1}{3}$ of the total cement bricks was produced. On the third day $\frac{3}{4}$ of the remaining amount was produced.

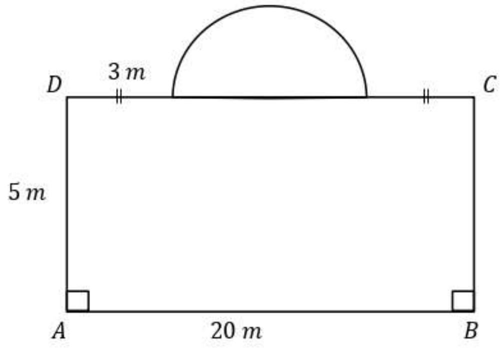
i. What fraction of the total cement bricks was produced on the first two days.

ii. What fraction of the total cement bricks was produced on the third day

iii. The amount of cement bricks produced on the third day is 60 more than the amount of cement produced on the last day. Find the total amount of cement bricks required to complete the order

iv. If the time taken to produce the remaining amount of cement on the third day by 3 men is 8 hours. How much time will it take if two men work to produce the remaining amount of cement on the last day?

02. It is proposed to arrange a stage in an open-air theater consisting of a rectangular and a semicircular section as shown in the figure.



i. Find the radius of the semi circular part

ii. Calculate the area of the whole stage

iii. A new rectangular section with an area of 1 m^2 more than $\frac{1}{3}$ of the total area is to be added to the stage. Draw this rectangular section on the figure, that attached to the side AB with measurements.

iv. It is proposed to construct an iron fence along the stage including the newly added section. The project officer says that a if it costs Rs: 4700 to build 1m of for the fence, the total cost for the fence will exceed. Rs. 300 000 Are you agree with him. Give reasons.

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03. A moneylender barrows Rs 50,000 from a financial Institution that charges an annual compound interest rate of 20%.

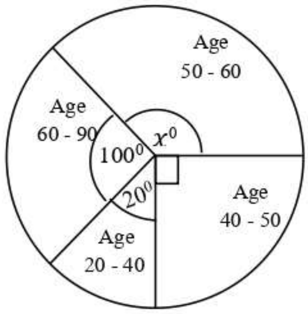
i. What is the interest at the end of the first year

ii. After investing above principal amount for two years in another financial institution which pays simple interest monthly, the profit he obtained was Rs: 20000, Calculate the interest earned for one year by investing money in the second financial institution

iii. Calculate the annual simple interest rate charge by the second financial institution.

04. The information shows how a group of people who were infected with a certain pendemic disease according to their ages.

Age	No. of patients
20 - 40	2
40 - 50	……..
50 - 60	……..
60 - 90	……..

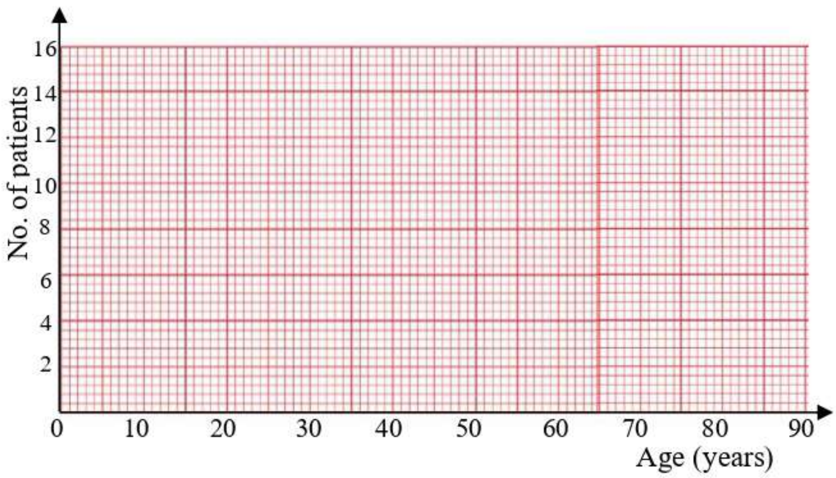


i. Find the value of "x" in the pie chart.

ii. According to pie chart fill in the blanks of the table

iii. Illustrate this information in a histogram

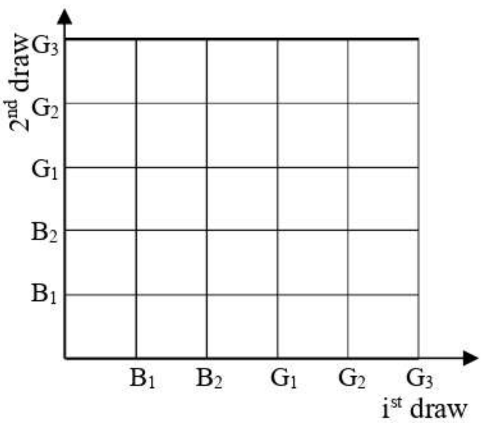
iv. Draw the frequency polygon on this histogram



05. There are 2 black balls and 3 green balls of same shape and size are in a box. Black balls are marked as 1 , 2 and the green balls are marked as 1 ,2 and 3. A student takes one ball out randomly and record the colour, then put it again to the box. After that takes a ball again and record the colour of it.

i. Represent the sample space on the given grid using (x) sign
(B$_1$, B$_2$ shows black balls and G$_1$, G$_2$, G$_3$ shows green balls.)

ii. Encircle the event which the two balls are in different colours. Find its probability.



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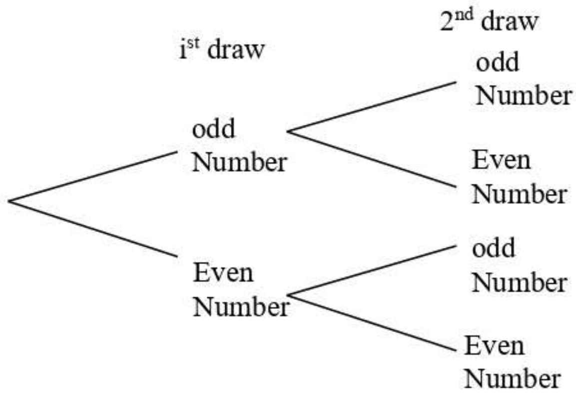
Note that the number on the ball was also recorded for each of the above events.

iii. Complete the following tree diagram.



iv) Using the tree diagram find the probability of taking a ball that have an even number atleast once.

v) Explain with reasons whether it is more likely to obtain two different colours of balls in two attempts or to obtain at least one colour marked with an even number.

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Second Term Test, 2025

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Grade 11

ගණිතය - ii
Mathematics - ii

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3 Hours

- Answer 10 questions selecting five questions from part A and fire questions from part B.

The volume of a sphere of the radius $\boldsymbol{r}$ is $\frac{4}{3}\pi r^3$ and the volume of a cone of base radius $\boldsymbol{r}$ and $\boldsymbol{h}$ is $\frac{1}{3}\pi r^2 h$ $(\pi = \frac{22}{7})$

PART A

01. A refrigerator worth of Rs: 80 000 can be purchased by paying Rs. 20 000 initially and the balance can be settled in 12 equal monthly installments of Rs: 5 650. If the interest is calculated in the reducing balance method, calculate the annual interest rate charged

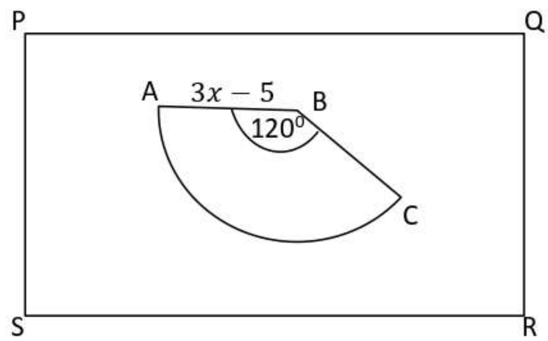
02. An incomplete table of values prepared to draw the graph of the function $y = x^2 - 2x - 5$ is given below

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

a) i. Find the value of y when $x = 1$
ii. Draw the graph of the above function on the graph paper by taking 10 small square divisions along both the x axis and y axis to represent one unit as scale.

b) Using the graph,
i. Write down the equation of the axis of symmetry
ii. Write down the interval of values of x for which the function is negative
iii. Write the equation of the graph according to $y = (x + a)^2 + b$ form when the above graph is shifted upwards by 2 units. (a and b are constant values)
iv. According to above write down the co-ordinate pairs of the minimum point of the fuction $y - 3 = x^2 - 2x - 5$

03. As shown in the diagram, a rectangular metal sheet PQRS has a sector shaped metal sheet ABC, with half the area of the rectangle. That sector shaped part cut out from it. If the area of the remaining metal sheet. $2\pi r^2 + 2\frac{1}{3}\pi$ is , construct a quadratic equation using the given information and solve it. Show that the radius of the sector part is approximately 23cm. (Take $\sqrt{19} = 4.35$)



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04. At a certain moment, a pilot in an observational aircraft flying on a horizontal path from East to west at an altitude of 1200 m above sea level observes two ships A and B which anchored in the sea ahead. At that time, ship A was observed at an angle of depression of 30^0 and ship B was observed at an angle of depression of 60^0 (The aircraft and the two ships are located on the same vertical plane).

i. Represent the above information in a rough sketch
ii. Select a suitable scale and draw a scale diagram
iii. Using the scale diagram, find the distance between the two ships to the nearest whole number.
iv. When the pilot observes ship A at an angle of depression of 60°, how far has the aircraft traveled westwards from its initial position?
v. If it takes 10 seconds for the aircraft to travel that distance, what is its speed in ms^{-1} (metres per second)

05. a) In a fruit shop, the total number of apples and mangoes sold on a certain day was 215. The fruit seller makes a profit of Rs: 25 per mango and Rs: 20 per apple. The seller said that the profit from selling mangoes on that day was Rs: 200 more than the profit from selling apples. By taking the number of mangoes sold as 'a' and the number of apples sold as "b" construct a pair of simultaneous equations. Find the number of mangoes and the number of apples sold separately on that day by solving the above pair of equations..

b) On another day, the seller sold 90 apples and 'p' number of mangoes. The income he received did not exceed Rs: 3750. Construct an inequality including 'P' and considering this information. Solve it to find the maximum number of mangoes sold on that day.

06. Following table represents the data recorded by a person engaged in diary farming as a self employment. The amount of milk obtained in a month with 30 days is given in that frequency distribution

No. of litres	16-20	20-24	24-28	28-32	32-36	36-40
No of days	4	5	6	8	5	2

i. What is the modal class of this frequency distribution?
ii. By taking the mid value of the modal class as the assumed mean find the mean number of litres of milk collected per day to the nearest liter
iii. Find the monthly income received from selling milk at Rs. 175 per liter
iv. He has to spend Rs: 50,000 per month for the food and other expenses of the dairy cows. Show that the Monthly profit does not exceed Rs: 100,000

PART B

07. Hiruni, who is engaged in a flower selling business near a temple sold 50 flower baskets each and every day of the first month of a certain year. Ther the number of flower baskets sold per day in each month is 20 more than the number of flower basekels sold per day in the previous month

i. Write down the number of flower baskets sold per day on the first, second and third months.
ii. In which month she sold 170 flower baskets per day
iii. If the profit earned prom a flower basket is Rs: 20 and she worked 30 day's in each months find the total number of flower baskets she sold at the end of a year. Show that the annual income earned by Hiruni is not exceed Rs. 1 000 000?

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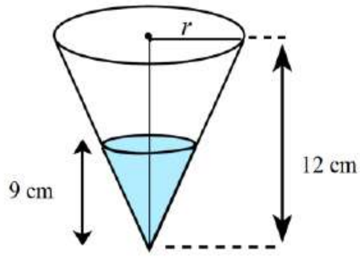
08. Use only a straight edge with cm/mm scale and a pair of compasses for the following construction. Show the constructions lines clearly

i. Construct the triangle ABC such that AB = 7cm , BC = 5cm and $A\hat{B}C = 60^0$
ii. Construct angle bisector of $A\hat{B}C$
iii. Complete the quadrilateral ABCD such that BD = 7cm
iv. Construct a straight ling through the point 'D' and parallel to AC and name the point it meets produced AB as "E"
v. Name the triangle which is equal in area to ABCD quadrilateral by joining EC. Give reasons.

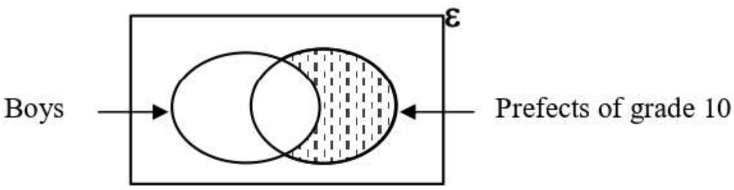
09. Completely filled hemispherical water tank with radius "a" supplies water to a conical tank with radius is "r" and height is 12 cm without any wastage. Then the height of the water level in the conical tank is 9 cm



Show that $a^3 = \frac{(9r)^2}{32}$

If r = 10 cm, find the value of "a" to the nearest whole number using logarithms.

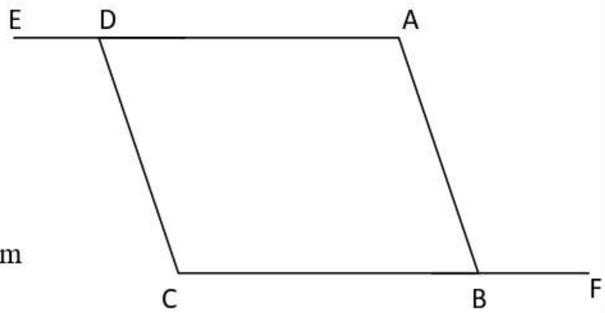
10. The following incomplete Venn diagram shows information about 200 students in grade 10 of a certain school



- The Number of male prefects in grade 10 is 25
- The number of female prefects is 15.
- The total number of boys is 130.

i. Copy the incomplete venn diagram into your answer script and include the given information
ii. Define the shaded region in words
iii. Find the probability that a student selected at rondom from this group is girl who does not hold the prefectship
iv. If there are 8 girls and 5 boys in this group who are to be selected as prefects in next year. Draw a new venn diagram including those information

11. ABCD is a parallelogram. The side CB and the side AD produced up to F and E respectively such that BF = DE



i. Show that $A\hat{B}F = C\hat{D}E$
ii. Prove that ABF Δ ≡ CDE Δ
iii. Show that AECF is a parallelogram
iv. If the ratio of the area of triangle ABF to the area of triangle ABC is 2:3, show that the area of parallelogram ABCD is equal to the area of triangle ABF

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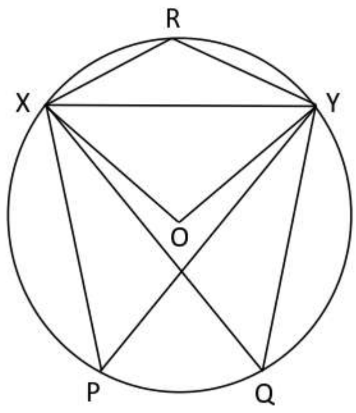
12. In a circle with centre O, $X\hat{P}Y = x^0$ Express each of the following angles in terms of x



i. $X\hat{O}Y$

ii. $O\hat{X}Y$

iii. $X\hat{O}Y$ (Reflex)

iv. $X\hat{R}Y$

v. Show that $X\hat{P}Y + X\hat{R}Y = 180^0$