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மாகாணக் கல்வித் திணைக்களம் - வட மத்திய மாகாணம்
DEPARTMENT OF EDUCATION – NORTH CENTRAL PROVINCE

ශ්‍රේණිය
11

Third Term Test – 2019

Mathematies - I

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කාලය : පැය **02** යි.

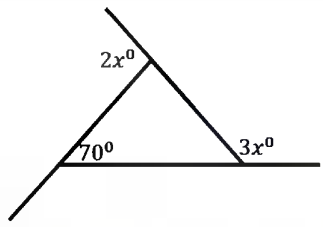
- **Answer all qnestion.**
- **Consider the area of circle is πr^2 and circnmference is $2\pi r$ when the radins of the circle is r (Take $\pi = \frac{22}{7}$).**

Part – A

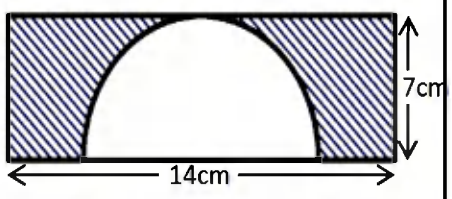
01. Find the inter quartile Rage of the following number distribution.
4 , 5 , 5 , 6 , 9 , 10 , 11 , 12 , 14 , 17 , 20

02. Simplify $\frac{2}{x} - \frac{1}{2x}$

03. Find the value of x according to the given figures.



04. According to the information in the diagram region.

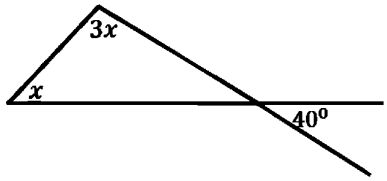


05. Factories $2x^2 - 8$

06. When selling a good for Rs. 22 400.00 a profit of 12% is received. Find the buying price of the good.

07. Solve $\frac{3}{x} - 1 = 2$

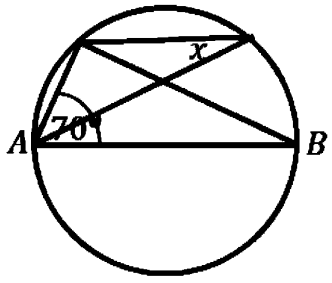
08. According to the information given in the figure find the value of x^0



09. Find the product of matrices A and B $A\begin{pmatrix} 2 & 1 \\ 0 & 3 \end{pmatrix}$ $B\begin{pmatrix} 0 & 1 \\ 2 & 5 \end{pmatrix}$

10. Find the minimum area of a paper which can be pasted on the curved surface of a right circular cylinder of radius 5 cm and height 14 cm

11. AB is a diameter, According to the information in the figure find the value of x



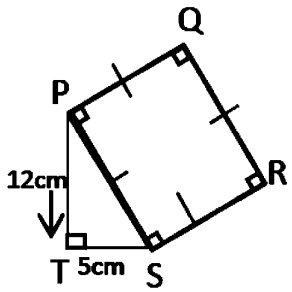
12. If $P = \{x: -1 < x \leq 2, x \in z^+\}$ list out the elements of the set P

13. A Train which travels at the speed of 20 meters per seeond takes 7 seconds to pass a signal tower find the length of the train.

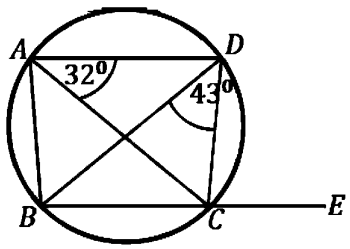
14. If the faetors of the quadratic expression $x^2 + x - 6$ are $(x + 3)(x - 2)$. Solve the equation $x^2 + x - 6 = 0$

15. How many days spend by 3 men to complete the half of a work when 10 mcn completc within 3 days.

16. According to the information given in the figure find the area of thc square $PQRS$

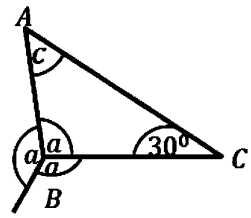


17. According to the information in the figure find the value of $D\hat{C}E$



18. The sample space of an experiment having equals likely event is S Probability of the event B is $P(B) = \frac{1}{7}$ and $n(B) = 9$ find $n(S)$.

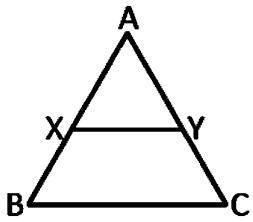
19. According to the information in the figure find the value of a^0 and c^0



20. 300 shares which were bought for Rs. 43.00 each are sold when the market priee of a share is Rs. 50.00 find the capital gain

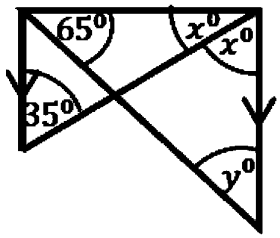
21. Solve the inequality $x + 3 < 7$ and show the solution on a number line.

22. The mid points of the sides AB and AC are X and Y in the triangle ABC. If $AX = AY = 4cm$ and $XY = 6\,cm$, find the perimeter of the quadrilateral $BCYX$

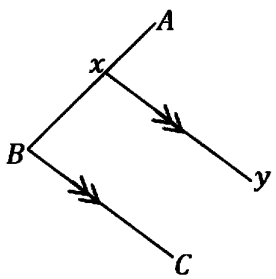


23. The third term of an arithmetic progression is 21 and fifth term is 29. Find the eommon differenee of the progression.

24. According to the information in the figure find the values of x and y



25. Draw the locus of moving point equidistanee from the sides AB and BC. Then name the point it meets xy as o



Part – B

- **Answer all questions.**

01. Coconut Developing Board introduces a project of distributing coconut plants. $\frac{1}{5}$ Of coconut plants are distributed to schools and $\frac{2}{3}$ for farmers and $\frac{1}{2}$ of the remainder distributed for religious places.

a.

i. What is the part of the coconut plats separated for schools and four mars from the total number of coconut plants?

ii. What is the part of coconut plants distributed for religious places from the total number of coconut plants.

iii. The remaining number of coconut plants is 1000 then the remaining number of coconut plants are given to the defense camps. Find the total number of coconut plants separated for this project.

iv. Later it is decided that $\frac{1}{4}$ of number of coconut plants separated for farmers should be given for religious places, Accordingly, find the total number of coconut plants separated for religious places.

02. Nalani pawns her jewels in a bank and gain a loan of Rs. 45 000.00

a.

i. If she paid Rs. 5 400.00 as the interest to the bank for one year. Find the annal interest rate charged?

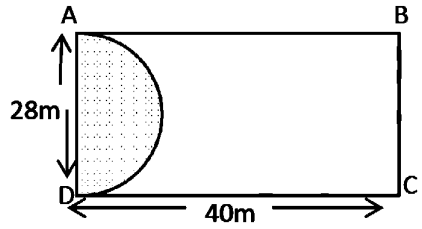
ii. After paying the interest she renews the loan. Then pay off it after 1 ½ years. Find the total amount she paid to pay off the loan.

b.

i. Saman invested Rs. 60 000/- in a company which pays a divided of Rs. 4/- per share and received Rs.12 000/- as the dividend after one year. Find the buying price of a share.

ii. After one year he sold all the shares at the same price. Then 2880 shares were bought by investing that amount of money and dividend income. Find the buying price of a share in the company.

03. ABCD is a rectangular shape pond is attached farm. A semicircular shape pond is attached to the boundary AD. The remaining area of the land is used to grow paddy.

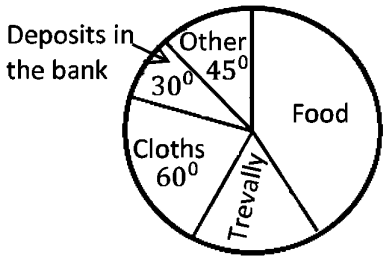


i. Find the surface area of the semicircular shape land.

ii. Write the ratic of area of the land which paddy is grown and the pond, in the simplest form

iii. A right angled triangular part is added to the boundary BC. Out of the land such that the area is twice the area of the pond and the other boundary on the extended DC. Draw that part in the above diagram with measurements.

04. The following pie chart represents how a person spends his monthly salary within a month. The expenditure on food is twice than the expenditure of travelling.



i. Find the magnitude of the center angle of the sector of expenditure of travelling.

ii. If the deposited amount in the bank is Rs. 4 000/-, Find the amount spend for cloths.

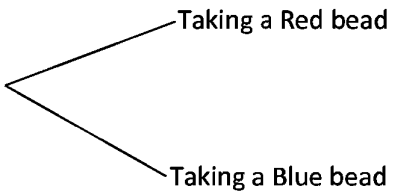
iii. According to the information in the pie chart find his monthly salary.

iv. If he receives the same salary for the next month, he deposits Rs. 2 000/- in the bank which is separated for cloths. Accordingly find the magnitude of the center angle of the sector of deposits.

05. A red bead and 4 Blue beads are in a bag. Mahela takes a bead out of the bag randomly and colur is noted.

a.

i. An incomplete tree diagram related to the experiment are given below. Indicate the probability on each branch.

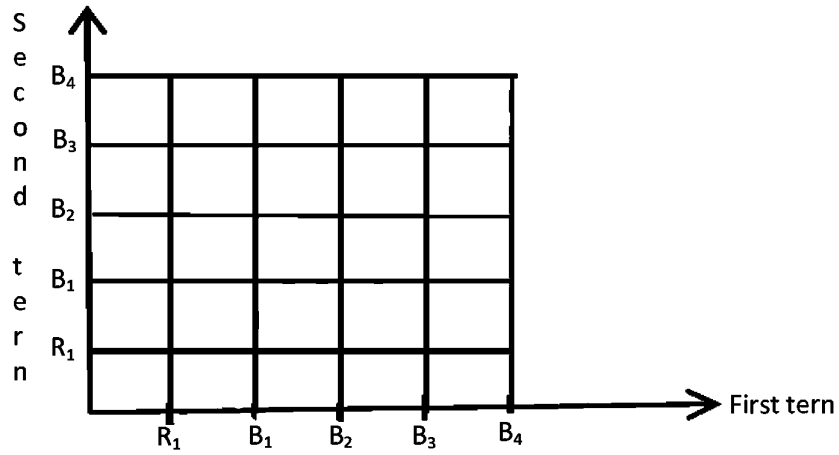


ii. If Mahela takes second bead without putting the first bead to the bag, Extend the above tree diagram and indicate the probability.

iii. Find the probability of taking a Blue bead in the second time.

b.

i. In the above experiment, If the first ball is put in to the bag by noted down it's colour and again a bead is taken out complete the grid give below.



ii. Find the probability of taking two beads in different colours.

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Third Term Test – 2019

Mathematics - II

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කාලය : පැය **03** යි.

- **Answer 10 qnestion.**
  Selecting 5 qnestions from part A and 5 qnestions from part B.
- **Take the radius r of the bottom, the height h, and the volume $\pi r^2 h$ of the vertical cylinder.**
- **Let $\frac{4}{3}\ \pi r^3$ be the volume of a sphere radins.**

Part – A

01. Sunimal Obtained an amount of money from a financial institute as loan on simple interest at the interest rate of 8% for 2 years. Then he deposits that amount in another institute on compound interest for 2 years at interest rate of 10%. At the end of 2 years sunimal received a profit of Rs. 5000.00 after paying the loan and interest for the first institute. Find the amount of money obtained as the loan.

02. An incomplete table used to draw the graph of the function $y = x^2 - 2x - 3$ is given below.

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

(a)

i. Find the value of y when $x = 1$

ii. Draw the above graph of the function by taking 10 Small divisions along both x and y axis as 1 unit

(b) Using the graph ,

i. Describe the behavior of function when y increases from -4 to 0

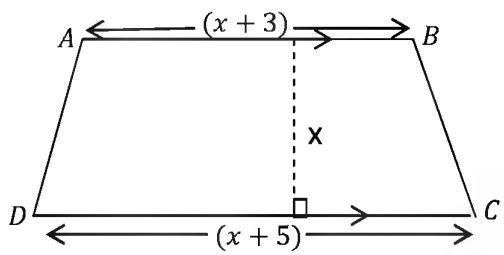
ii. Draw the straight liner $y = -2$ on the graph and find the value of x when $y = -2$

iii. write two roots of the function when it is shifted 3 units along the positive direction of y axis

03.

(a) The area of trapezium $ABCD$ is $44cm^2$ Build up an expression for the area. According to the information given in the figure. Hence show that the value of x can be taken by 2 $(2\sqrt{3} - 1)$.

(b) Find the length of the side DC to the nearest whole number $(\sqrt{3} = 1.73)$



04.

(a) From a set of customers, some customers bought pre paid cards of Rs. 50.00 and some customers bought Data Cards of Rs. 99.00 . The total value of all cards is Rs. 1590.00. The sum of twice the number of customers who bought Rs. 50.00 cards and the number of customers who bought Rs. 99.00 cards is 34

i. Build up a pair of simultaneous equations by taking the number of Rs. 50.00 cards as x and number of Rs. 99.00 cards is y

ii. By solving the equations find the number of customers who bought Rs. 50.00 cards and Rs. 99.00 cards separately

(b) In a certain week 20 cards of Rs. 99.00 and "a" number of Rs. 50.00 were sold. If the value of above cards are less than Rs. 3200.00. Build up an inequality and find the maximum number of Rs. 50.00 cards sold.

05. The following frequency distribution is prepared related to the number of vehicles that came to a certain service center during a month.

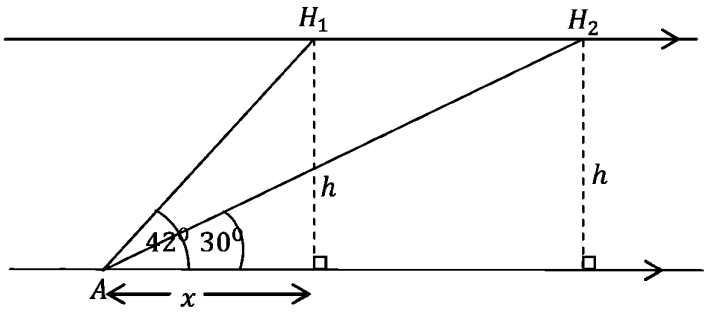
No of vehicles (Class – intervals)	6 - 10	11 - 15	16 - 20	21 - 25	26 - 30	31 - 35	36 - 40
No of days (frequency)	2	3	5	10	6	3	1

i. What is the model class of the distribution.

ii. By taking a suitable assumed mean or by any other method find the mean number of vehicles in a day to the nearest whole number.

iii. A profit of Rs. 250.00 is received by the crevice center from a vehicle. Find the profit received by the center in a month.

06. A person observes a helicopter from the point A on the ground, when it travels at the place of H_1 at the angle of elevation 42^0 after 10 seconds, He observes the helicopter when it travels at the place H_2 at the angle of elevation 30^0



A Sketch drawn including the data is given. Neglect the height of the observer and answer following questions.

i. Build up an equation for $\tan 42^\circ$ including x and h

ii. Consider the distance travelled within 10 seconds is approximately 500 m and build up an equation for $\tan 30^\circ$ including x and h

iii. Build up an equation without h using the equations in i and ii

iv. Find the value of x using that equation.

v. Find the height to the helicopter from the ground.

Part - B

07.

(a) In an arithmetic progression, when third is added to 30, 8^{th} term is obtained.

i. Find the common difference of the progression.

ii. If the sixth term of the progression is equal to seven times of the first term, find the first term.

iii. Find the sum of first 12 terms of the new arithmetic progression which is obtained by multiplying first term and common difference by 3

(b) In a geometric progression fourth term is 81 and common ratio is 3, write first three terms of the progressions

08. Use a straight edge of cm/mm scale and a pair of compass to do the following constructions. Show construction lines clearly.

i. Draw a circle of radius $4cm$ and the center A

ii. Draw a circle such that the radius is $5cm$ and $6cm$ away from A . The center of the circle is B

iii. Draw two tangents to the circle of center A from the point B and name the tangential points as P and Q

iv. Write the relationship of angles $P\hat{B}A$ and $A\hat{B}Q$

v. Name the intersection points of the circle and the line BA as x and y. then obtain the triangle Pxy . What is the type of the triangle Pxy

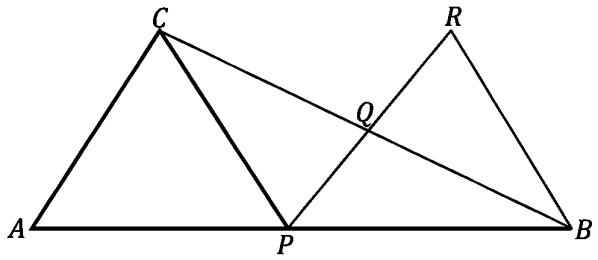
vi. Name the circle of center A, related to the triangle Pxy

09.

(a) In a metel right cylinder of radius $4cm$ the height is three times of the radius. When 3 solid spheres are made in equal size by melting the above cylinder $\frac{1}{6}$ of the volume of the cylinder is wasted. Show that the radius of the sphere is $2 \times \sqrt[3]{5}$

(b) Find the radius of a sphere to the second decimal place using log tables.

10. In the triangle ABC , P is the midpoint AB . The line $B\ C$, meets the line which is drawn parallel to AC through P at Q The line $P\ Q$ is extended to R such that $PQ = QR$. BR and PC are joined.



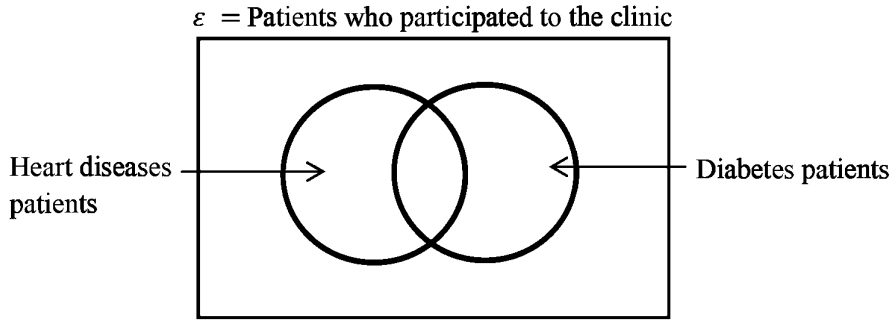
i. Copy the above diagram and indicate data.

ii. Show that the triangle PQC and BQR are congruent

iii. Show that P B R C is a parallelogram

iv. Name an equi angular triangle. Hence prove that $AC : QR = BC : BQ$

11. 60 Patents Patients for a medical clinic. It is realized that 38 of than are not in heart diseases and out of them 16 people are diabetes Patients. The number of patients who are both diabetes and heart diseases is 15.



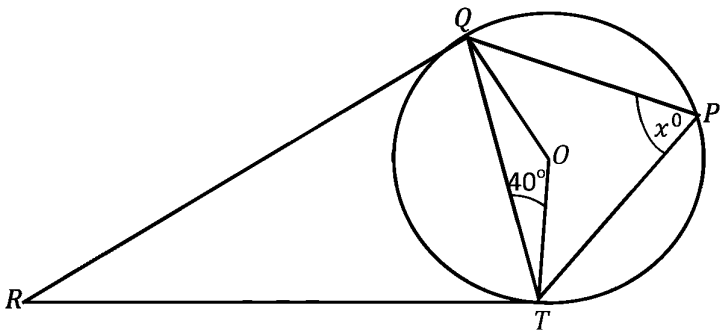
i. Represent above information in the given ven diagram clearly.

ii. What is the number of parents who haven't diabetes but infections with heart diseases?
It is decided that medicine is given to all diabetes patients and a few patients who are not infect diabetes. The number of heart disease patients who received medicine is 18 and the number of patients who did not receive medicine is 20

iii. Copy the ven diagram of i and dram a subset to show the patients who medicine should be given. Then include all data to the ven diagram.

iv. Find the number of patients who are not infected diabetes and the medicine is received.

12. RQ and RT are two tangents drawn from. R



(a) Find the value of x using given data write a theorem you use to obtain the answer.

(b) Show that the area of triangles RQO and ROT are equal

(c) Show that $RQOT$ is a cyclic quadrilateral and find the value of $Q\hat{R}T$