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දකුණු පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව / தென் மாகாணக் கல்வித் திணைக்களம்

DEPARTMENT OF EDUCATION-SOUTHERN PROVINCE

THIRD TERM TEST - 2021 (MARCH 2022)

Grade 10

Mathematics - 1

Time: 2 hours

Name/ Index No

❖ Answer all the questions in this paper it self.

❖ Each corret answer carries 2 marks in part A and 10 marks for each question in part B.

01. Select and underline the value of $\sqrt{22}$ to the first approximation.

1. 4.5

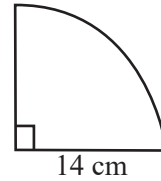
2. 4.6

3. 4.7

4. 4.8

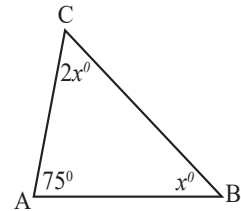
02. It takes 3 men 5 days to complete a certain task. What is the magnitude of twice of the work in mandays?

03. Find the arc length of the sector

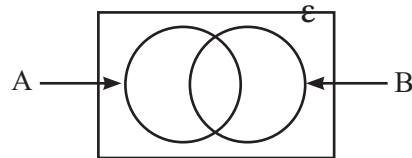


04. Factorize $x^2 - 5x + 6$

05. Find the value of x using the information given in the diagram



06. Shade the region $A \cup B$ in the Venn diagram

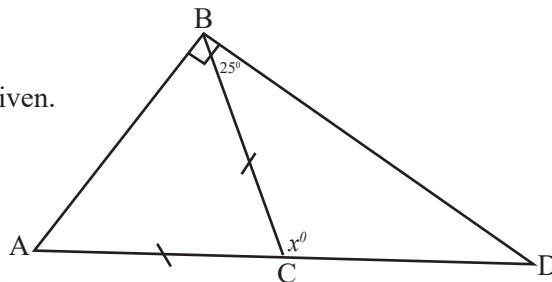


07. Solve. $\frac{1}{2x} - \frac{1}{3x}$

08. Find the interest that has to be paid for 6 months on a loan of Rs. 50,000 borrowed at an annual interest rate of 12%?

09. A cylinder is made out of a rectangular piece of cardboard of 22cm length and 10cm width by taking the width of the rectangle as the height of the cylinder. Find the curved surface area of the cylinder.

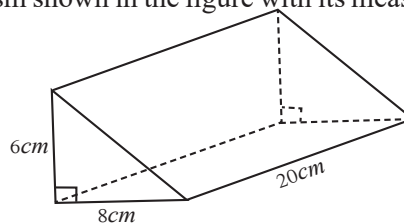
10. Find the value of x using the information given.



11. There are identical red and blue balls in a container. The number of balls in the container is in between 10 and 20. When a ball is taken out randomly, the probability of getting a blue ball is $\frac{2}{5}$. How many red balls are there in the container?

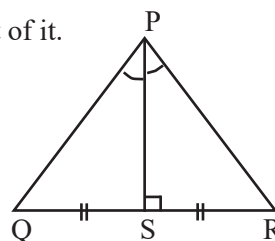
12. Solve $(x - 3)(2x - 1) = 0$

13. Draw two different rectangular faces in the triangular prism shown in the figure with its measurements.



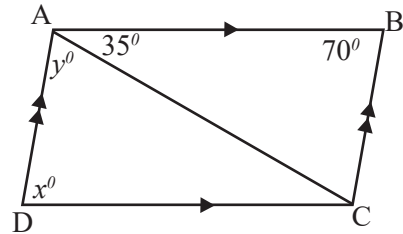
14. If the pair of triangles PQS and PQR in the given figure are congruent in the following cases, place \checkmark in front of it and if they are not congruent place X in front of it.

S.S.S	
S.A.S	
A.A.S	
R.H.S	



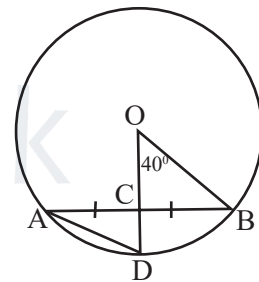
15. Write the equation of the straight line which is parallel to the $y = 3x - 2$ straight line and passes through $(0, 2)$.

16. Find the values of x and y according to the data given in the ABCD parallelogram shown in the figure



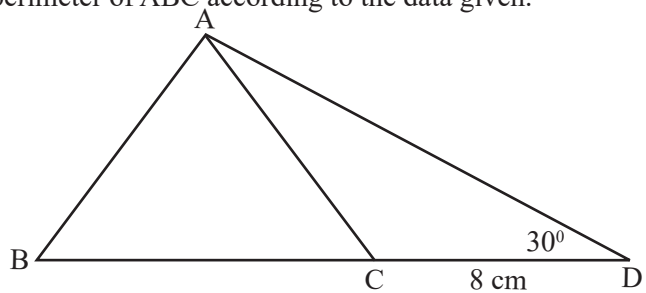
17. Find the least common multiple of $6a^2b$, $4a$.

18. C is the midpoint of AB of the circle with centre O. Find the value of \widehat{ADC} .



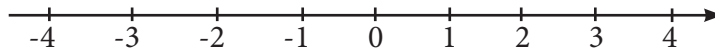
19. Write $\lg 3 = 0.4771$ in index notation.

20. ABC is an equilateral triangle. Find the perimeter of ABC according to the data given.

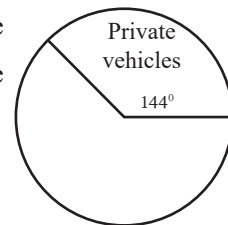


21. A train travelling at a uniform speed travels 48km in 40 minutes. Find the speed in kilometers per hour.

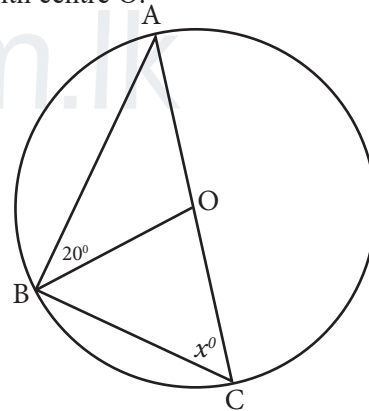
22. Solve the inequality $3x - 1 < 2$ and represent the solutions on the given number line.



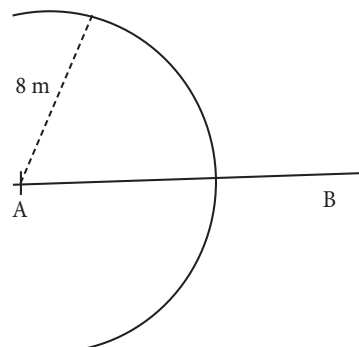
23. The pie chart drawn represents some of students in a class coming to the school by their private vehicles. If the number of that students is 16 find the total number of students in the class.



24. Find the value of x according to the data given in circle with centre O.



25. A and B are two points at a distance of 14m from each other. Mark a point P, which is equidistance from A and B and 8m away form A.



Part B

❖ Answer All the questions on this paper itself.

(01) On a day all the patients who came to a private hospital for residential treatments were performed to PCR test and $\frac{1}{8}$ of them were referred for quarantine. $\frac{5}{14}$ of the remaining patients referred for surgery.

(i) Find the number of patients who were not quarantine as a fraction of the total number patients. (2 marks)

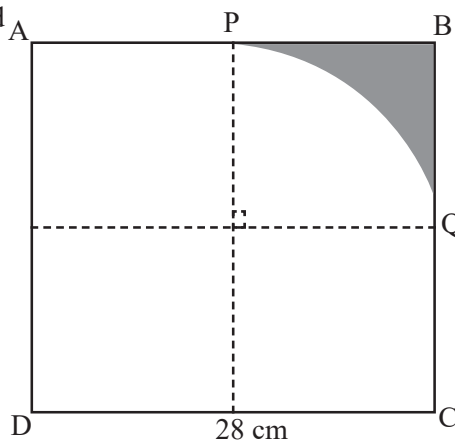
(ii) Find the number of patients referred for surgery as a fraction of the total number patients. (2 marks)

(iii) If the remaining number of patients after referred to surgery is 18, find the total number of patients who came to the hospital on that day. (4 marks)

(iv) If this hospital charges Rs. 3200 for a PCR test, find out how much the hospital will receive from PCR test only on that day. (2 marks)

(02) The figure shows ABCD square plate of side length 28cm

The shaded part of the plate was cutoff and remove. P and Q are the mid points of the side AB and BC.

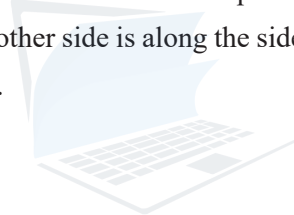


(i) Find the arc length PQ (2 marks)

(ii) Find the perimeter of remaining (APQCD) part (2 marks)

(iii) Find the area of the shaded part (4 marks)

(iv) A right angled triangular part has to be cut out from the plate. The area of it is four times the area of the shaded part. One side is DC and the other side is along the side DA. Draw the way how to cut it from the above figure with the measurements. (2 marks)



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(03) A table with the information on how the taxes are calculated by the Inland Revenue Department is given below.

Annual Income	Tax percentage
Initial Rs. 500 000	Tax Free
Next Rs. 500 000	4%
Next Rs 500 00	8%
Balance taxable income	12%

i. If the annual income of an individual is Rs 750 000, calculate the income tax he has to pay for a year (2 marks)

(ii) Nimal pays an income tax of Rs 36 000 for the annual income from his business. Find his annual income. (4 marks)

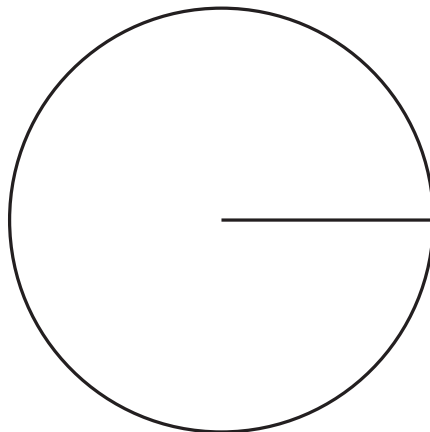
(iii) The assessed annual value of Nimal's business place is Rs 30 000. If he has to pay an annual rate of 8%. Calculate the rates that he has to be paid for a quarter. (4 marks)

4. 04) Below is a table of how 60 employees of a private company get in to their work place.

Mode of transport	By Bus	Walking	Motor bicycle	Other Vehicle
Number of employees	18	12	.....	.....
Angle at the center	.....	.....	.....	60°

(i). Complete the table given above. (5 marks)

(ii) Complete the pie chart using the data in the table. (3 marks)

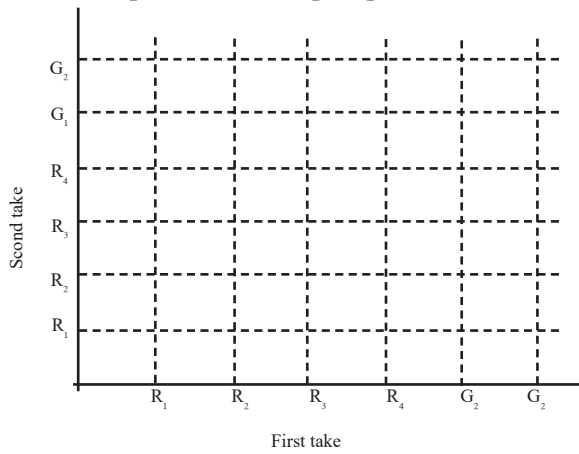


(iii) If on one day all the people who are coming by bus came in other vehicles, what is the angle at the centre of the new pie chart for other vehicles considering this information?

(2 marks)

5. a) A box contains 4 red apples and 2 green apples of same size. An apple is taken out from the box at random and then it is put back in to the box. Then an apple is randomly taken out again.

i. Represent the sample space relevant to this experiment in the grid. (3 marks)



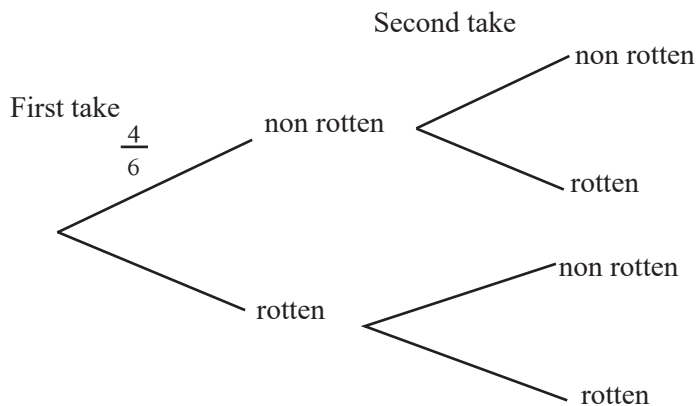
(ii) Encircle the event of obtaining 2 apples taken out in two colours in the grid and find the probability of it. (2 marks)



- (b) Two apples in the box were rotten and the rest were non rotten apples. An apple is taken out a randomly From the box and put it back. Then an apple is randomly taken out again.

Complete the tree diagram below by considering these information.

Find the probability of getting a rotten apple in fist take and a non rotten apple in the second take. (5 marks)



Name/ Index No

- ❖ Select 5 questions from part A and 5 questions from part B and write the answers.
- ❖ Volume of a right circular cylinder of the base radius 'r' and height 'h' is given by $\pi r^2 h$ and take $\pi = \frac{22}{7}$

PART -A

- (01) The following is a frequency distribution of the amount of rice sold in a particular shop within a month.

Amount of rice sold perday (kg)	40 -50	50 -60	60 -70	70 -80	80 -90	90 -100
Number of days	1	6	12	5	4	2

- (i) What is the modal class of the frequency distribution. (1 mark)
- (ii) By taking the mid value of the modal class as the assumed mean or any other method find the mean amount of rice sold perday in kilogrammes to the nearest whole number. (6 marks)
- (iii) The shop owner had stored 2 300kg of rice. During this month he made a Profit of Rs 15 per kilogramme of rice and after this month he made a profit of Rs 20 per kilogramme. Find the total profit he earned by selling 2300kg of rice (3 marks)
- (02) An incomplete table prepared to draw the graph of the function $y = 3 - x^2$ is given below.

x	-3	-2	-1	0	1	2	3
y	-6	-1	2	.....	2	-1	-6

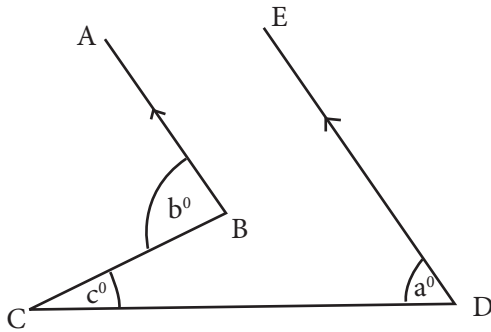
- (a) (i.) Find the value of y when $x = 0$ (1 mark)
- (ii) Using the scale of 10 small divisions along the x axis and y axis as one unit and draw the graph of the function (3 marks)
- (b) Using the graph
- (i) Write the equation of the axis of symmetry (2 marks)
- (ii) Write the range of values of x, where the function is positive (2 marks)
- (iii) Find the value of $\sqrt{3}$ using the graph. (2 marks)
- (03) a) There are 24 coins of Rs 2 and Rs 5 are in a till . The total value of Rs 2 and Rs. 5 coins is Rs. 90. By taking the number of Rs. 2 coins as x and Rs. 5 coins as y build up a pair of simultaneous equation. Find the value of x and y by sloving the simultaneous equation. (7 marks)
- b) Solve $\frac{5}{a-3} + \frac{2}{a-3} = 1\frac{3}{4}$ (3 marks)

4. (a) A rectangle is obtained by adding one metre to a one side and subtracting one metre from the other side of the adjacent sides of a square. The area of the rectangle is 80 m^2 . By taking the length of the square as x ,
- (i) Write the length and breadth of the rectangle using x . (2 marks)
- (ii) Build up a quadratic equation for the area of the rectangle and by solving it find the value of x . (5 marks)
- (b) If $a + b = 7$, $ab = 12$ Find the value of $a^2 + b^2$ (3 marks)
5. a) A is the top of the communication tower AB of 60 m height. A technician who is repairing at A observed his vehicle parked at C with an angle of depression of 60°
- (i) Draw a scale diagram using the scale 1 : 1000 (4 marks)
- (ii) Find the distance BC in metres using the scale diagram. (2 marks)
- b) A vehicle took $1\frac{1}{2}$ h to travel 90km and it took $2\frac{1}{2}$ h to travel the remaining 130 km of the journey. Find the average speed of the vehicle. (4 marks)
6. a) Samith borrowed a loan of Rs 40 000 to pay import value and custom duty of the imported item from a bank at an annual simple interest rate of 12%. Find the total amount that he has to pay at the end of the year. (4 marks)
- b) Samith had to pay a custom duty of 25% of the import value to import an item. He decided to sell it to get a profit of 20%. If the item was sold for Rs 51 750 including 15% of value added Tax (VAT). Find the import value of the item. (6 marks)

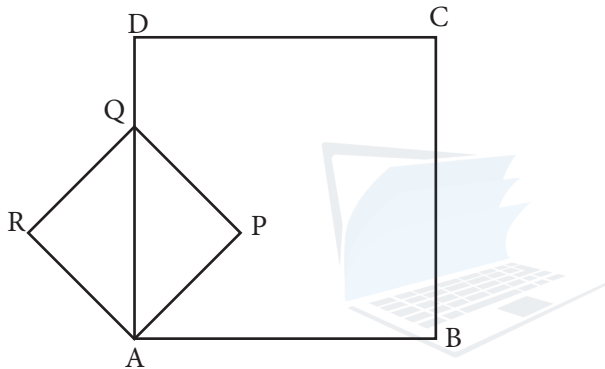
Part B

7. It is proposed to erect 25 flag poles at distances of 8m, 13m, 18m, from the stage at a sports venue.
- (i) Are the distances mentioned here in a parallel series? Give reasons (2 marks)
- (ii) How far should the 15th flagpole be placed from the stage? (2 marks)
- (iii) Which flagpole is 128m away from the stage? (2 marks)
- (iv) Nimal runs from the stage to the first flag pole and returns to the stage. Then runs to the second flagpole and returns to the stage. He did this game until the final flag pole. Find the total distance that Nimal ran. (4 marks)
8. In the following constructions, use only a straight edge with a cm/mm scale and a pair of compass. Show the construction lines clearly.
- i. Construct the triangle ABC with $AB = 5\text{cm}$, $BC = 8\text{cm}$ and $\hat{A} = 60^\circ$ (4 marks)
- ii. Mark a point D so that ABCD is a parallelogram and construct the ABCD parallelogram. (2 marks)
- iii. Construct a circle by taking the shortest diagonal of the parallelogram as the diameter of the circle. (3 marks)
- iv. Find the shortest distance from B to the point where the longest diagonal of the parallelogram intersect the circle you constructed. (1 mark)

9. (a) Find the value of a° by using b° and c° according to the information given in the figure below. (4 marks)

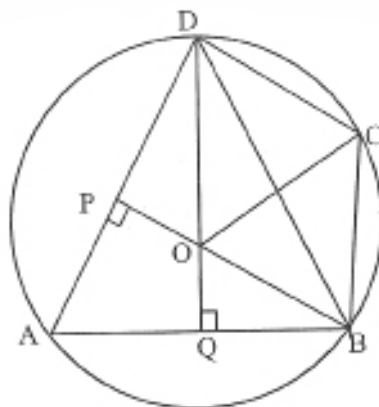


- (b) ABCD and PQRA are two squares. Show that $\hat{QAR} = \hat{PAB}$ and prove that $\triangle DAR \cong \triangle PAB$ (6 marks)



10. (10) A, B, C and D points are on the circle with centre 'O'.

P and Q are the base of the perpendiculars drawn from B and D to AD and AB respectively. BP and DQ intersect at 'O'



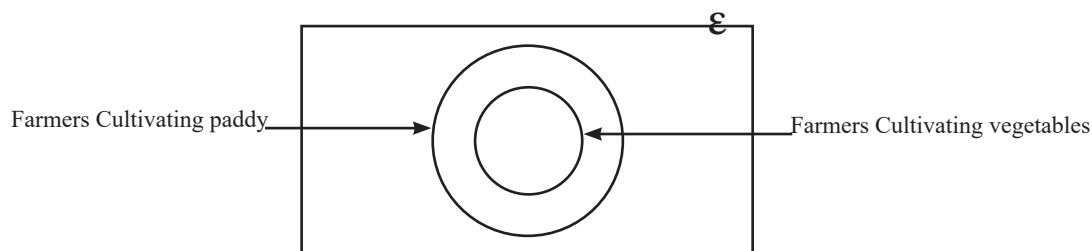
- (i). Copy the figure and mark the given information. (2 marks)
- (ii) Prove that $\triangle DOP \cong \triangle BOQ$ (2 marks)
- (iii) Show that $AB = AD$ (3 marks)
- (iv) Show that $\hat{BOD} = 2(\hat{BDC} + \hat{DBC})$ (3 marks)

- (11) The length of a prism whose cross section is a right angled triangle is 6a cm. In the cross section the length of the two sides which include the right angle are a cm each. A cylinder of radius a and height h is made out by melting the prism. Show that the height of the cylinder is given by

$$h = \frac{3a}{\pi}$$

Taking that $a = 6.2\text{cm}$ and $\pi = 3.14$ and using logarithmic tables find the value of h to the nearest first decimal place (10 marks)

- (12) There are 100 farmers living in senapura village. 88 of them are cultivating paddy and 54 of them are cultivating vegetables additionally.



- (i) Copy the given venn diagram and write the number of elements in each region. (3 marks)
- (ii) How many farmers were there who didn't cultivate vegeables? (2 marks)
25 farmers who cultivated vegetables in senapura Village abandoned their paddy cultivation and six farmers who cultivated only paddy stopped cultivating paddy due to non-receipt of fertilizer on time.
- (iii) Represent the above information in a venn diagram by considering the data changed. (4 marks)
- (iv) How many farmers do not cultivate paddy in that village now? (1 mark)