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Department of Education, Southern Province

පළමු වාර පරීක්ෂණය 2019 මාර්තු
First Term Test, March 2019

10 ශ්‍රේණිය
Grade 10

Mathematics - I
ගණිතය - I

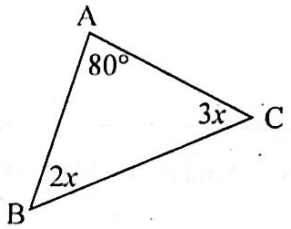
පැය දෙකයි
Two hours

- **Answer all the questions in this paper itself.**
- **Each correct answer in part A carries 2 marks and part B carries 10 marks.**

Part A

01. 5 men can complete half of a work within 6 days. Find the magnitude of the whole work in man days.

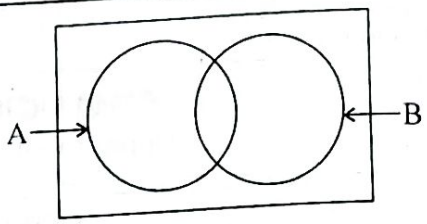
02. According to the given figure find the magnitude of x.



03. Factorize $x^2 - 2x - 15$

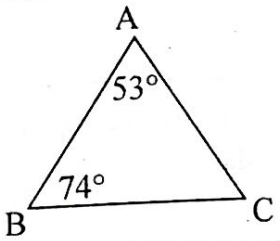
04. State 125 as a power of 5.

05. Shade the region $A \cap B$ in the Venn diagram.



06. Solve $\frac{2x}{3} - 1 = 5$

07. Write two equal sides of this triangle.

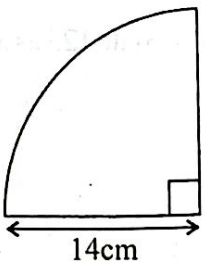


08. Find the capacity of the cube shaped tank of side lenth $2m$ in litres.

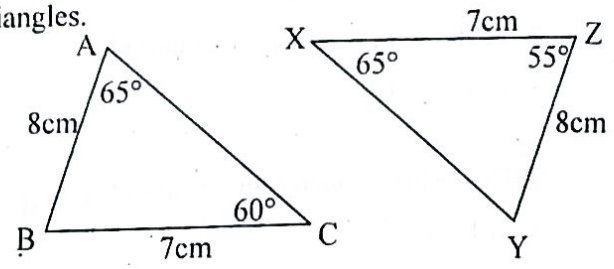
09. Find the LCM of $4x^2y$, $12xy^2z$

10. Find the probability of getting a card with a prime number from the cards number from 1 to 10.

11. Radius of this sector is 14 cm. Find the area.



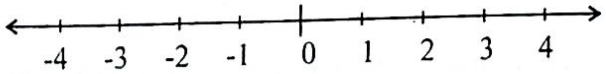
12. Write the type of congruency of the below triangles.



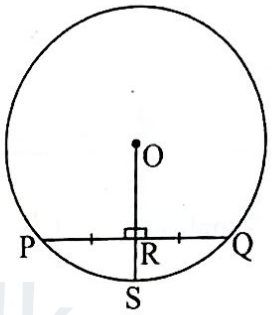
13. Select and underline the first approximation of $\sqrt{23}$

(i) 4.7 (ii) 4.8 (iii) 4.9

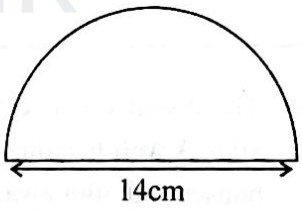
14. Represent the solution of the inequality $x + 1 < 1$ on the number line



15. The centre of the circle is **O** and it s radius is 10 cm.
IF PQ = 16 cm find the length of OR.

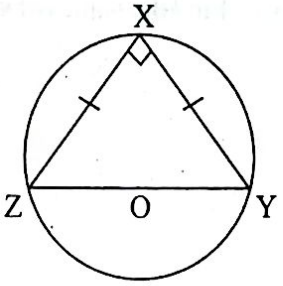


16. Find the arc length of the given semi circle.



17. Simplify $\frac{5a}{6} + \frac{a}{12}$

18. Using the given information find the magnitude of $X\hat{Y}Z$



19. Write the class size of a class interval

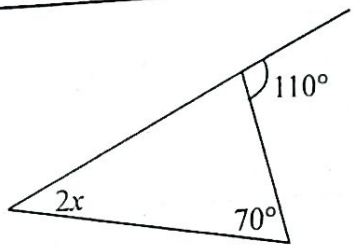
0 - 8, 8 - 16, 16 - 24, ...

20. Fill in the blanks using suitable numbers.

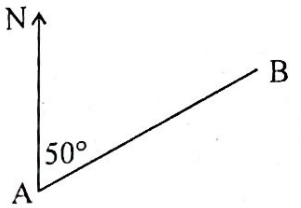
$2y = 4x - 6$

The gradient of this straight line is ..... and the intercept is .....

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

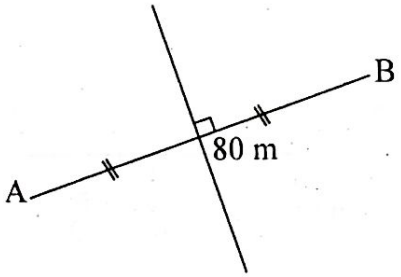


22. The bearing of B from A is 050^0. Find the bearing of A from B

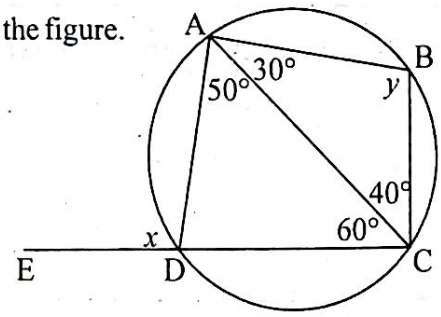


23. Simplify $\left(\frac{1}{2} + \frac{1}{3}\right) \times 2\frac{2}{5}$

24. The distance between the two houses A and B is 80m. A well is going to dig equi distance from two houses and 50m away from the house A. Mark the correct place for that on the given figure.



25. Find the values of x and y using the information given in the figure.



Part B

(01) From the vehicles in a vehicle sale $\frac{2}{5}$ made in Japan. The remaining vehicles made in other countries. $\frac{1}{6}$ of the vehicles which made in other countries made in a European country.

(i) Write the number of vehicles as a fraction which are made in other countries, other than Japan. (02 marks)

(ii) Write the number of vehicles as a fraction which are made in. European country. (02 marks)

(iii) If there are 60 vehicles which are made in Japan Find the number of vehicles which are not made in Japan and in. European country. (03 marks)

(iv) By considering the number of vehicles given in the above find the ratio among the vehicles made in Japan, European country and which are not made in these two countries. (03 marks)

(02) (a) Nimal sells 10 perches of a land he owns at the price of Rs. 175000 per perch .

(i) Find the selling price of the land. (02 marks)

(ii) If a broker charged Rs. 87000 for selling that land calculate the commision percentage that he charged. (02 marks)

(iii) A broker sells another land & charges the same commission percentage as in the above. If he gave Rs 1900 000 to the owner of the land find to selling price of that land (03 marks)

(b) If the number of men is x and number of days is y then $xy = k$. In here k is a constant. 8 men can complete a task within 12 day. Find how many men are required to complete the task in 16 days using the above equation (03 marks)

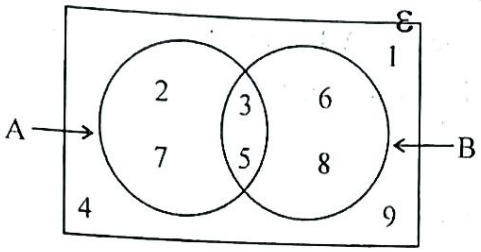
(03) (a) In a box there are 5 blue colours pens, 2 red colour pens and 3 black colour pens. All are identical. Out of them 3 are with faults. Kasun randomly taken a pen from the box.

(i) Write the sample space of the event. (02 marks)

(ii) Find the probability of getting a red colour pen. (02 marks)

(iii) Find the probability of getting a pen without a fault. (02 marks)

(b) Using the given Venn diagram write the below sets with the elements.



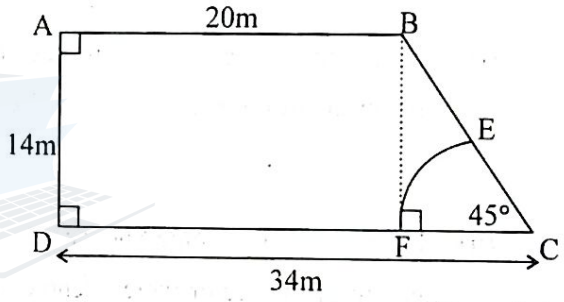
(i) A'

(02 marks)

(ii) A ∪ B

(02 marks)

(04) This figure shows a trapezium shaped land ABCD. There is a sector shaped pond with the center O.



(i) Find the arc length EF

(02 marks)

(ii) If BE = 5.8 m find the perimeter of the remaining land without the pond. (02 marks)

(iii) Find the surface area of the pond.

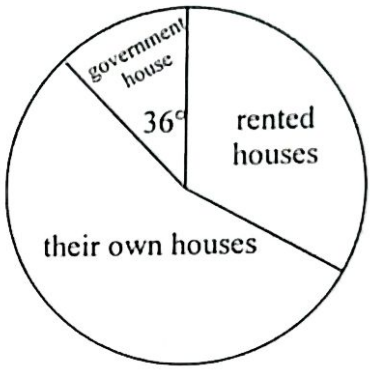
(02 marks)

(iv) Find the area of the land without the pond.

(02 marks)

(iv) It is required to seperate a rectangular part to grow to plant flowers. Its area is twice the area of the pond and AD is to be one of its boundaries. Mark that part with measurements in the above diagram. (02 marks)

(05) Information of a survey collected from 200 famillies regarding the ownership of their houses is depicted in a pie chart,



Using the pie chart.

(i) Find the number of families lived in government houses. (02 marks)

(ii) If the number of rented houses represented in the pie chart is 60, find the angle at the centre of the sector which denotes rented houses. (02 marks)

(iii) From the families who lived in their own houses $\frac{1}{3}$ lived as subfamilies. Find the number of subfamilies. (02 marks)

(iv) From a housing project it is decided to give houses for those who live in government houses, rented houses and subfamilies. Represent this information using another pie chart. (04 marks)

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Department of Education, Southern Province

පළමු වාර පරීක්ෂණය 2019 මාර්තු
First Term Test, March 2019

10 ශ්‍රේණිය Grade 10	**Mathematics - II** ගණිතය - II	පැය තුනයි Three hours

- **Answer five questions from part A and five questions from part B.**
- **Each question carries 10 marks.**
- **Volume of a cylinder with base radius r and height h is given by $\pi r^2 h$**

Part - A

(01) (i) Find the value of $\sqrt{8.217}$ accurate to two decimal places. (04 marks)

(ii) A vendor mark the price of an eletric item worth Rs. 8000 by keeping a profit of 15% But when selling it a 5% discount is given. find the selling price and profit percentage of the electric item. (06 marks)

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

x	-2	-1	0	1	2
y			-2		4

(i) Copy the table and fill in the blanks. (03 marks)

(ii) using a suitable scale draw the graph (03 marks)

(iii) Write the gradient and intercept of the graph (02 marks)

(iv) On the same cartesian plane draw the graph $y = x$ and shade the region $y \leqslant x$ (02 marks)

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(03) (i) Expand and simplify $(x + 3)^2$ (02 marks)

(ii) Using the above expression find the value of 103^2 (02 marks)

(iii) length & breadth of a rectangular shaped land is $(2x + 7)$ and $(3x - 1)$ respectively. Express the area of the land as a trinomial quadratic expression. (03 marks)

(iv) If $a = 3b$ then verify that $(a - b)^2 = a^2 - 2ab + b^2$ (03 marks)

(03 marks)

(04) (i) Factoize $x^2 - 5x - 24$

(ii) Find the LCM of the algebraic expressions $4x^2 - 9$, $4x - 6$, $4x^2 - 12x + 9$ (07 marks)

(05) Below shows mathematics marks obtained by 40 students in grade 10 at a test.

15, 27, 35, 32, 29, 43, 40, 32, 27, 27,
24, 38, 17, 28, 34, 40, 36, 23, 37, 26,
42, 23, 16, 37, 33, 33, 41, 33, 27, 32,
24, 21, 20, 29, 32, 37, 36, 25, 32, 28,

(i) Find the range of the marks. (02 marks)

(ii) Using the above data complete the below table by separating in to class intervals such that 15 - 19, 20 - 24 ..... . Class size is 5. (04 marks)

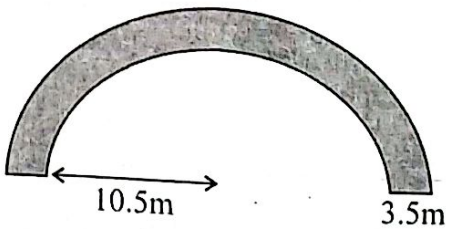
Class intervals	Tally marks	Number of student
15 - 19		
20 - 24		

(iii) If the students who obtained less than 30 marks, directed to a remedial programme, How many student are there in that programme (01 marks)

(iv) Find the modal class using the above distribution. (01 marks)

(iv) Find the median class using the above distribution. (02 marks)

(06) (i) The figure shows a semicircular pond of radius 10.5 m. The shaded region is a stage around the pond and its width is 3.5 m using the knowledge of factors or any other method show that the area of the stage is **134 ¾** m^2. (06 marks)



(ii) It is estimate that 20 men will take 20 days to build a building.

(a) What is the magnitude of the task in man days ?

(b) 6 men work during the first 4 days. Then 11 men work the next 6 days. How many men required to complete the remaining task within 20 days as estimated..
(04 marks)

Part B

(07) A worker cut pieces of rods of different lengths from iron rods which are 5m in length in order to build a gate. length of the first piece is 25 cm and all the other piece are 10 cm. longer than the previous piece.

(i) Write the lengths of the first, second and the third pieces cut by the worker. (01 mark)

(ii) Build up an expression using n for the length of the n^{th} piece (T_n) (02 marks)

(iii) Hence find the length of the 15^{th} piece. (02 marks)

(iv) Which piece gives a 5cm piece as the remaining part when pieces are cut using 5m rod as given in the above . (03 marks)

(v) Show that a 5m long rod will not be sufficient to cut the 50th piece. (02 marks)

(08) Using only a scale of cm / mm straight edge and a pair of compasses to draw clearly the following constructions.

(i) Construct the triangle ABC in which AB = 6 cm BC = 5 cm and $A\hat{B}C = 120^0$ (03 marks)

(ii) Construct the perpendicular bisector of AB and name the in trisection point of AB and the perpendicular bisector as D. (02 marks)

(iii) Construct the locus of a point moving equidistance from AB and BC. (02 marks)

(iv) Name the intersection point of the above two loci in (ii) and (iii) as O and construct the circle taking O as the centre and OD as the radius. (02 marks)

(v) Write the magnitude of $B\hat{O}D$. (01 mark)

(09) The below table shows how few exhibition stalls located with respect to the entrance.

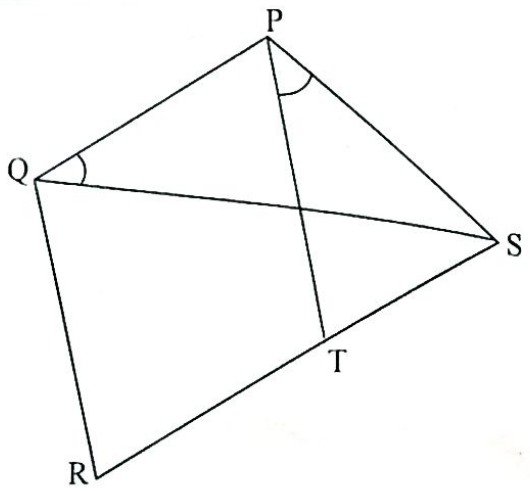
	Distance	Bearing
Flower plants shop	40m	000°
Fruit plants shop	30m	090°

(i) Draw a scale diagram using the scale 1 cm representing 5m of actual distance. (Draw a rough sketch before draw the scale diagram) (06 marks)

(ii) Find the distance from fruit plants shop to flower plants shop. (02 marks)

(iii) Find the bearing of the entrance from the fruit plants shop. (02 marks)

(10) In the given Figure $P\hat{Q}S = T\hat{P}S$ and $Q\hat{P}S$ and $Q\hat{R}S$ are supplementary angles.



(i) Prove that $P\hat{Q}R + P\hat{S}R = 180^0$ (02 marks)

(ii) Prove that $P\hat{T}S = R\hat{Q}S$ (08 marks)

(11) PQR is a triangle such that PQ = QR and PQR is a right angle. S is any point on PR . PX and RY are perpendiculars drawn to the extended QS line. Represent the above data in a figure and with reasons show that,

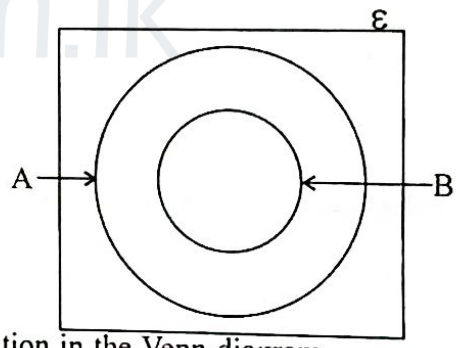
(i) $Q\hat{R}Y = X\hat{Q}P$ (04 marks)

(ii) $PQX\Delta \equiv QRY\Delta$ (03 marks)

(iii) PX = QY (02 marks)

(iv) With reasons show that the difference of lengths PX and RY is equal to the length of XY. (01 mark)

(12) Copy the given Venn diagram and include the elements in the following sets.



ε = {1, 2, 3, 4, 5, 6, 7, 8, 9}

A = {1, 2, 3, 4, 5, 7, 9}

B = {2, 3, 5, 7}

Answer the following based on the information in the Venn diagram.

(i) B' (02 marks)

(ii) $A \cap B$ (02 marks)

(iii) $(A \cap B)'$ (01 marks)

(iv) $(A \cup B)'$ (03 marks)