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Department of Education, Southern Province

පළමු වාර පරීක්ෂණය **2019** මාර්තු
First Term Test, March 2019

II ශ්‍රේණිය
Grade 11

Mathematics - I
ගණිතය - I

පැය දෙකයි
Two hours

- **Answer all the questions in this paper itself.**
- **Every question in part A carries 2 marks and every question in part B carries 10 marks.**

Part - A

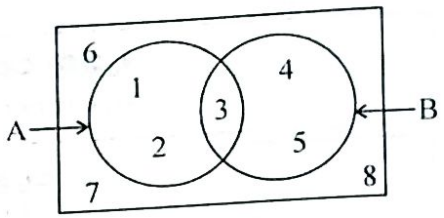
01. Kumara borrowed Rs. 5000 at an annual simple interest rate of 12%. Find the interest to be paid after 2 years.

02. Simplify $(a^2)^3 \times a^3$

03. Find the value of $\log_2 32$

04. If $3^x = 81$ find the value of x.

05. Write the set A' with it's elements.



06. Find the LCM of $2x^2y$, $3xy$

07. If lg 52.5 = 1.7202 then find the value of lg 0.00525

08. The radius of a cylinder is 7 cm and its height is 10 cm. Find the area of the curved surface. (Area of the curved surface is given by $2\pi rh$ where r is the radius and h is the height of the cylinder.)

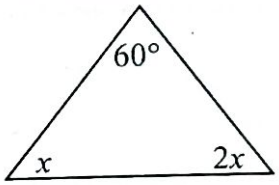
09. Write $4\sqrt{5}$ as an entire surd.

10. Remove the brackets and simplify. $(2x-3)(x+4)$

11. **How long it will take to fill a tank completely of capacity 150*l* using a pipe which flows water at a uniform rate of 30*l* per minute.**

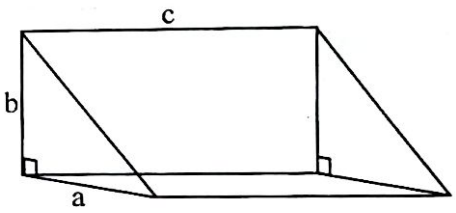
12. Factorize $3x^2 - 4x - 4$

13. Using the given information of the figure find the value of x.



14. Write $3\sqrt{x^{-2}}$ with positive indices.

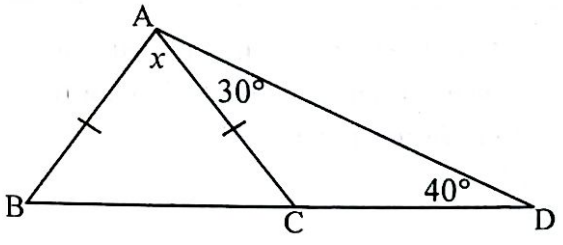
15. Write the volume of the triangular prism in terms of a, b, c



16. Solve $x^2 - 25 = 0$

17. Rationalise the denominator of $\frac{9}{\sqrt{3}}$

18. AB = AC using the information given in the figure find the value of x.



19. Simplify $\frac{2}{3x} - \frac{1}{2x}$

20. If the below statements are correct place a "✓" if incorrect place a "X".

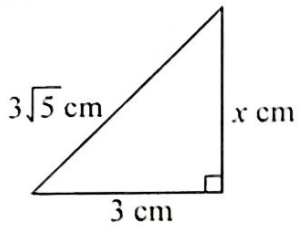
(i) Every faction can write as a recurring decimal or terminating decimal. ( )

(ii) Some irrational number can write as recurring decimal. ( )

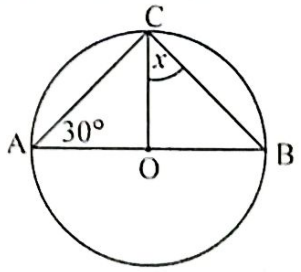
(iii) Any real number is a terminating decimal or an recurring decimal. ( )

21. Diameter of a solid hemisphere is 14cm. Find its curved surface area. (curved surface area of a sphere is given by $4\pi r^2$, r is the radius)

22. Find the value of x.



23. Centre of the circle is O and AB is a diameter. Find the value of x.



24. In a bag there are red colour identical cards numbered 1, 2, 3, 4 and blue clour identical cards numbered 1 and 2. A card taken out randomly. Find the probability of getting a card with an even number.

25. Mark the point which is placed equi distance from A and B and 3cm away from the mid point of AB.

Part - B

(01) Ranil decided to cultivate paddy $\frac{1}{2}$ of the land, innala in $\frac{1}{3}$ of the land, $\frac{2}{3}$ of the remaining he decided to cultivate corn and vegetables in the remaining portion of land.

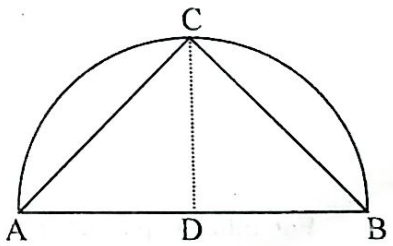
(i) What fraction of the total land paddy and innala are cultivated.

(ii) What froction of the total land corn are cultivated.

(iii) Find the fraction of the total land on which vegetables are cultivated.

(iv) If the corn cultivated area is 20 perches more than the vegetable cultivated area find the area of the whole land.

(02) The figure shows a semi circular flower bed of diameter 14m. In the ACB triangular part a special flower plants are grown and in the two segments other flowers are grown. D is the centre of the circle. CD and AB are perpendicular to each other.

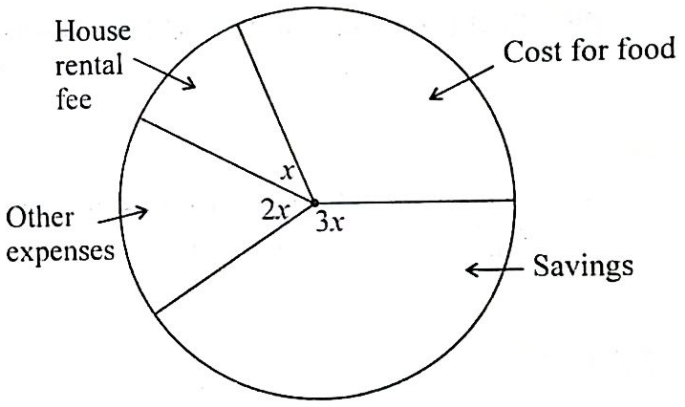


(i) Find area of the ACB triangular part.

(ii) Find the area of the segments which other flowers are grown.

(iii) A rectangular plot of land attached to the flower cultivation such that the area of the rectangular land is equal to the total area of the segments and AB is a one side of the rectangular land. Sketch the plot of land with measurements and find the breadth of the rectangular land.

(03) This pie chart shows the way how Mr. Dayantha spend his last month salary for the given expenses.



(i) If he spend $\frac{1}{3}$ of his salary for food find the angle at the centre of the sector which represent the cost for food.

(ii) For other expenses he spend twice as the house rental fee and for savings he spend three time as the house rental fee. Find the angles at the centre of the other sectors and mark them on the pie chart.

(iii) If he spend Rs. 5000 as the house rental fee find the monthly salary of Mr. Dayantha.

(iv) In February he went to his own new house. If he spend the salary for the given expenses like earlier, find the new amount he saved.

(04) (a) Retired person Mr. Gunarathna start to cultivate Cinamon in his land. To prepare the land for it. He estimates that 5 men will take 12 days.

(i) What is the magnitude of the task in man days.

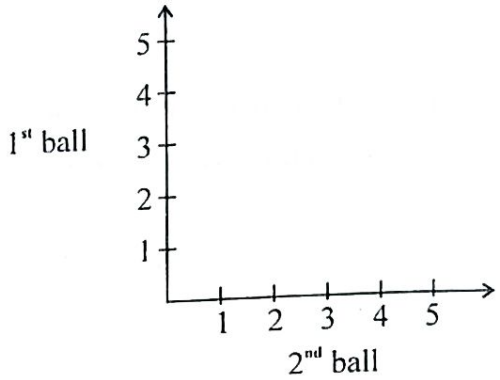
(ii) 5 men worked during first 4 days then a man got sick then other 4 men took 12 days to prepare the land. Find the magnitude of the whole task in man days.

(iii) If the fee of a worker is Rs. 2000 per day find the extra amount which Mr. Gunarathna have to pay for the workers than the estimated amount.

(b) The assessed annual value of a shop is Rs. 25000. If the relevant provincial council charges 4% of the value of the shop as rates calculate the rates that should be paid for a quarter.

(05) A box contains balls numbered from 1 to 5. A ball is randomly taken from the box, its number is recorded and put back in the box and another ball is randomly taken from the box and its number is recorded.

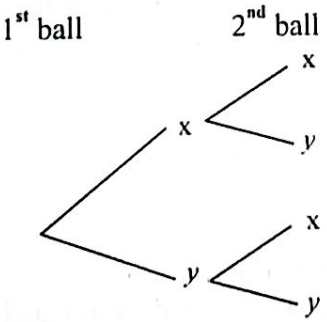
(i) Show the sample space in the grid.



(ii) Enclose the event which get the same number in both occasions in the grid and write its probability.

(iii) Complete the tree diagram for the above experiment.

(In here X represent the event getting a ball with an even number and Y is the event getting a ball with an odd number)



(iv) Find the probability of getting at least a ball with an even number.

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Department of Education, Southern Province

පළමු වාර පරීක්ෂණය **2019** මාර්තු
First Term Test, March 2019

II ශ්‍රේණිය
Grade 11

Mathematics - II
ගණිතය - II

පැය තුනයි
Three hours

- **Answer 10 questions selecting 5 questions from part A and five questions from part B.**
- **The volume of a cone of base radius r and height is $\frac{1}{3}\pi r^2 h$ and the volume of a sphere of radius r is $\frac{4}{3}\pi r^3$**

Part - A

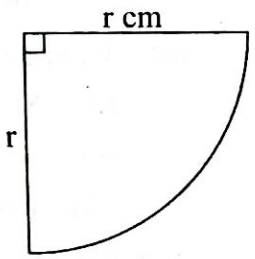
(01) (i) Write $\frac{5}{7}$ in decimal form and then write in a concise form.

(ii) Simplify $3\sqrt{2} + \sqrt{50}$

(iii) Solve $9 \times 3^{x-1} = 9^x$

(iv) Solve $2\lg 5 + \lg 4 = 2 \lg x$

(02) (i) Using the given sector of radius r cm a cone of slant height r and base radius x cm is made.



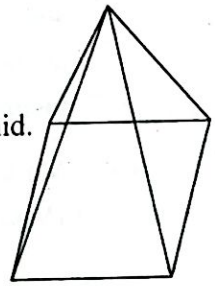
If the area of the base of the cone is 11 cm^2 show that $x = \frac{1}{4}$ r and $r = 4\sqrt{\frac{11}{\pi}}$

(ii) Taking the value of π as 3.141 find the value of r to the nearest first decimal place using the logarithm tables.

(03) (a) (i) Find the volume of a solid cone with base radius 7cm and perpendicular height 21cm.

(ii) By melting the above cone 6 identical spheres are made. Find the radius of a sphere.

(b) (i) This is a picture of a tent in the shape of a square based pyramid.



Side length of the square base is 4m and the perpendicular height of a triangular face is 3m. Find the area of the fabric needed to cover around the tent.

(ii) Find the length of fabric which is needed to cover the tent using 2m width fabric.

(04) (a) Using the result $(x - y)^3 = x^3 - 3x^2y + 3xy^2 - y^3$
Expand and simplify $(2x - 3y)^3$

(b) Simplify.

(i) $\frac{2}{x-2} - \frac{1}{x}$

(ii) $\frac{3x-6}{3x} \times \frac{1}{x-2}$

(iii) $\frac{x+4}{3x} \div \frac{x^2-16}{6x^2}$

(05) (a) Given below is a table of suitable values to draw the graph of the function. $y = 2x^2 - 3$

x	-3	-2	-1	0	1	2	3
y	15	5		-3		5	15

(i) Fill in the blanks in the table.

(ii) Draw the graph of the function $y = 2x^2 - 3$ taking 10 small squares as one unit of x axis and 10 as 2 units of y axis.

(b) Write down the answers using the above graph.

(i) Minimum value of the function.

(ii) Write the coordinates of the minimum point.

(iii) Write the equation of the axis of symmetry.

(iv) Find the range of x on which the function is negatively decreasing.

(06) (a) Thamara started a business by taking a loan of Rs. 500000 at the annual simple interest rate 8%. From the annual income of the bussiness first Rs. 500000 is tax free and the remaining amount is taxable and the tax percentage is 6%. As the tax and the annual interest for the loan she paid Rs. 24000 at the end of the year. Find the net income of the year after paying all the expenses.

(b) Marked price of an item is Rs. 1500. 12% of the marked has to be paid as the VAT (Value Added Tax). Find the VAT amount of that item.

Part - B

(07) The below table shows the amount of polythene collected as garbage during 30 days by a municipal council.

Mass (kg)	4 - 8	8 - 12	12 - 16	16 - 20	20 - 24	24 - 28
Frequealy (Number of days& (f)	3	4	8	10	3	2

(4-8 represent the values 4 or greater than 4 and less than 8)

(i) Write down the modal class.

(ii) Find the mean mass of polythene collect during a day.

(iii) Find the mass in metric tons of polythene collected during 100 days.

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(08) The n^{th} term of an arithmetic progression is given by $T_n = 3n + 2$

(i) Write down the first 3 terms.

(ii) Which term is 77 of this progression.

(iii) Find the sum of the first 50 terms using formulae in arithmetic progression.

(iv) Using the above answer in (iii) find the sum of the first 50 terms of the arithmetic progression with the general term $T_n = 3n + 1$

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(09) Using a straight edge and pair of compasses construct the following.

(i) Construct the triangle ABC such that AB = 6 cm, AC = 5 cm and $B\hat{A}C = 120°$

(ii) Construct a parallel line through C which is parallel to AB.

(iii) Construct the locus which is moving equi distant from BA and AC and name the intersection point of that locus and the above parallel line as D.

(iv) Is the triangle ABC an equilateral triangle. Give reasons.

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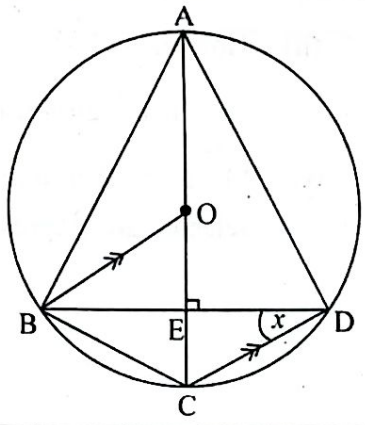
(10) A, B, C and D are four points on the circle. AC diameter is perpendicular to the chord BD. O is the centre of the circle. $B\hat{D}C = x$. BO // CD.



(i) $B\hat{A}C = x$. Give reasons.

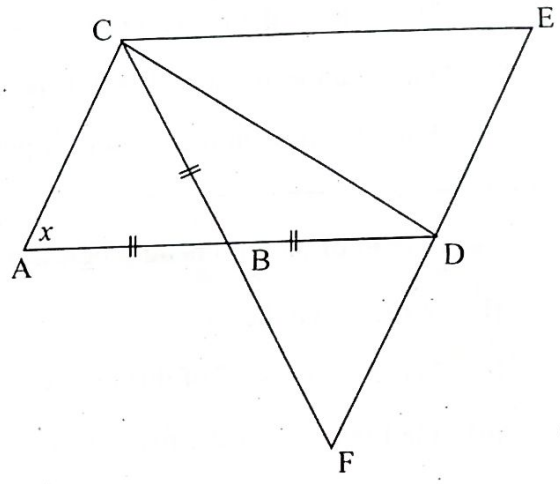
(ii) State the magnitude of $B\hat{O}C$ in terms of x with reasons.

(iii) Prove that BOE $\Delta \equiv$ ECD Δ

(iv) Show that BOCD is a parallelogram.

(v) Write the magnitude of $\hat{ABO}$ in terms of x.

(11) In the given figure AB = BC = BD. ADEC is a parallelogram. Extended CB and ED lines are meet at F. If $B\hat{A}C = x$.



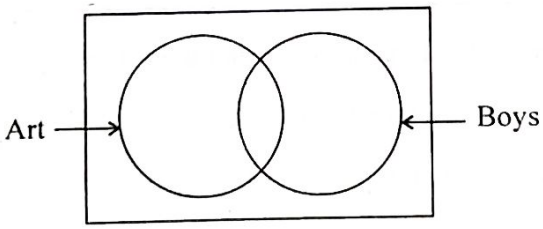
(i) Write the value of $\hat{CBD}$ using x.

(ii) Show that ABC$\Delta \equiv$ BDF Δ

(iii) Show that ED = DF

(iv) Show that $\hat{ACD} = 90°$

(12)



In a school there are 40 students in grade 7. They learn art and music as aesthetic subject. There are 17 boys in the class. 20 students learn art and 8 girls learn art.

(i) Copy the given Venn diagram and include the above information in it.

(ii) How many boys learn music ?

(iii) How many girls learn music ?

(iv) Music teacher transferred to another school. Due to this boys who learned music selected art. Represent this new data in another Venn diagram.