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மேல் மாகாணகல்விதிணைக்களம்
Western Provincial Education Department

පළමු වාර ඇගයීම - 2018
முதலாவது தவணை மதிப்பீடு - 2018
First Term Evaluation - 2018

11 ශ්‍රේණිය
தரம் 11
Grade 11

ගණිතය I පත්‍රය
கணித வினா தாள் - 1
Mathematics Paper - I

පැය දෙකයි
இரண்டு மணி நேரம்
Two Hours

Name/ Index No :

.....
Signature of Invigilator

Important:

- This paper consist of 8 pages
- Write your **index no** correctly in the appropriate place on the **page one** and **page three**.
- Answer all questions **on this paper itself**.
- Use the space provided under each question for working and writing the answer.
- It is necessary to write relevant steps and correct units.
- Marks will be awarded follows :
02 marks each for questions 1 – 25 in part A 10 marks each for questions in part B.

For marking examiner's use only

| Question number | | Marks |
|-----------------|--------|-------|
| A | 1 - 25 | |
| B | 1 | |
| | 2 | |
| | 3 | |
| | 4 | |
| | 5 | |
| Total | | |

.....
Marked by

Part A

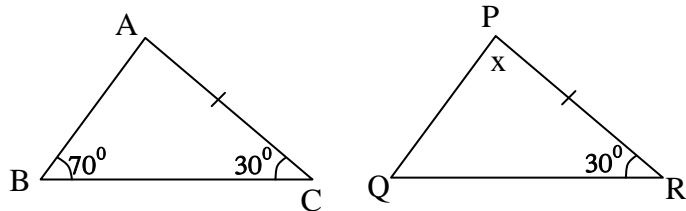
Answer all the questions on this paper itself.

1) If the annual simple interest received by a person who loaned Rs. 8 000 is Rs 1 200, find the annual simple interest rate he charges.

2) Express in logarithmic form. $2 = 10^{0.3010}$

3) Add. $\frac{1}{x} + \frac{3}{2x}$

4) If the triangle ABC and the triangle PQR are congruent under AAS, find the value of x.



5) If it takes 20 minutes to fill a tank completely with the capacity of 1000 l, find the rate at which water flow in liters per minute.

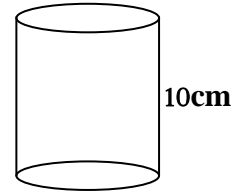
6) Find the least common multiple of $2a^2$ and $8ab$.

7) Marked price of a refrigerator is Rs. 50 000. If a VAT of 15% is charged for it, find the VAT that should be paid.

8) From the following values, the first approximation of $\sqrt{50}$ is ,

- i) 7.3 ii) 7.1 iii) 7.5 iv) 7.9

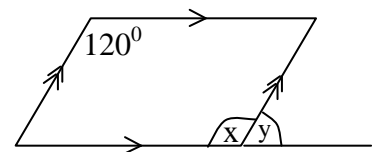
9) The circumference of the circular face of a cylinder is 22 cm. If the height of it is 10 cm, find the area of the curved surface of it. (Area of the curved surface = $2\pi rh$)



10) If $n(A) = 15, n(B) = 8$ and $n(A \cap B) = 12$, find $n(A \cup B)$.

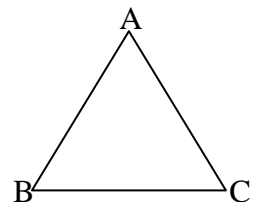
11) Find the factors. $x^2 + 9x + 20$

12) According to the information given in the figure, if $x + y = 180^\circ$, find the value of y .



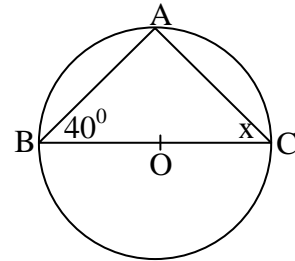
13) Solve. $\frac{3}{x} - 1 = 2$

14) In the triangle ABC, if $\widehat{ABC} = \widehat{ACB}$, write a relationship between the sides AB and AC.

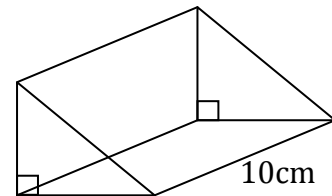


15) Find the gradient of the straight line which passes through the points (0,2) and (2,6).

16) In the circle with the centre O, BC is a diameter. A is on the circle. According to the given information, find the value of x.



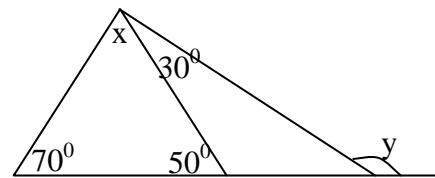
17) If the area of the cross section of the prism is 24 cm^2 , calculate the volume of it.



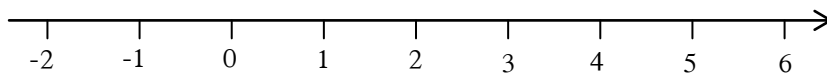
18) According to the given information, find

$x =$ _____

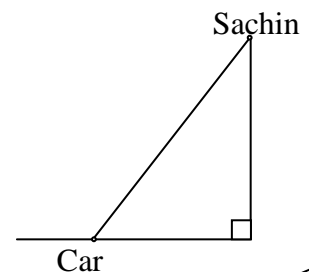
$y =$ _____



19) Solve the inequality $2x - 3 > 5$ and represent the set of real number solutions on the given number line.

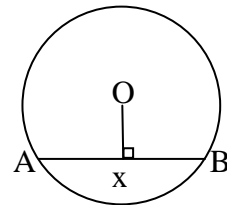


20) Sachin who is on the second floor of a building, observes a car parked on the road at an angle of depression 35° . Mark it on the diagram and write the value.

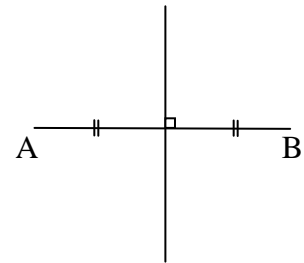


- 21) From the following data select and underline the one which is not a discrete data.
- Temperature
 - Time it takes to travel from home to school
 - Number of teachers in a school.
 - Thilina's weight

- 22) In the circle with the centre O, AB is a chord. If $AB = 6\text{ cm}$ and $OX = 4\text{ cm}$, find the radius of the circle.



- 23) It is needed to fix a lamp post equidistant to A and B buildings and 5m away from the AB border. Mark that point (T) on the diagram.



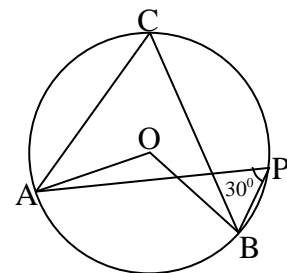
- 24) From the events given below, fill the blank boxes by putting 'i' if it is a simple event and by putting 'c' if it is a composite event.
- Getting 5 when a fair die is rolled.
 - Getting an odd number when a fair die is rolled.
 - Obtaining a red pebble from a bag containing a red pebble and a blue pebble

- 25) In a circle with centre O, the points A, P, B and C are situated on the circle.

If $\widehat{APB} = 30^\circ$, write suitable values for the blanks.

Magnitude of $\widehat{AOB} = \dots\dots\dots$

Magnitude of $\widehat{ACB} = \dots\dots\dots$



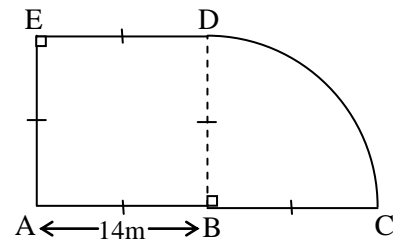
Part B

Answer all the questions on this paper itself.

- 01) $\frac{1}{4}$ of a land was reserved to build a house and $\frac{1}{3}$ of the remaining portion was reserved to cultivate crops.
- What fraction of the whole land is remaining, after reserving to build a house?
 - What fraction of the whole land is reserved to cultivate crops?
 - Due to an urgent need $\frac{2}{5}$ of the rest was sold for Rs. 160 000. What fraction of the whole land is remaining after selling the portion?
 - What is the value of the whole land?

- 02) A sketch of a land with ABDE square shaped portion and a sector with the angle at the centre 90° is shown in the figure.

(Take $\pi = \frac{22}{7}$ for the calculations)



- Find the DC arc length.
- It is needed to fix poles only on the DC border in such a way that the gap between two poles should be 2m. Calculate the number of poles needed.
- Calculate the area of the whole land.
- Another rectangular shaped portion of land with the same area as the above land is needed to be added, taking AE as the border of it. Find the length of the rectangular shaped portion of land.

- v. Draw the sketch of the newly added portion of land on the above diagram with the relevant measurements.

03) (a) The quarterly rates that should be paid for a house of annual assessed value Rs. 24 000, which is situated in a certain municipal council is Rs. 360.

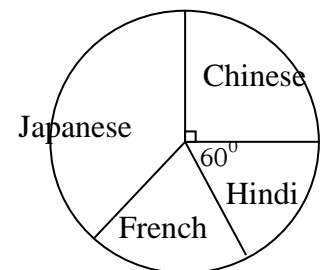
- i. What is the annual rates to be paid?
- ii. Calculate the annual rate percentage.

(b) Food sufficient for 15 cows for 10 days is stored in a certain farm.

- i. For how many days does this food is sufficient for one cow?
- ii. After 8 days 5 cows were taken to another farm. For how many days does the remaining food is sufficient for the remaining cows?

04) The following pie chart illustrate the information on the first bucket subjects selected by grade 10 students in a certain school.

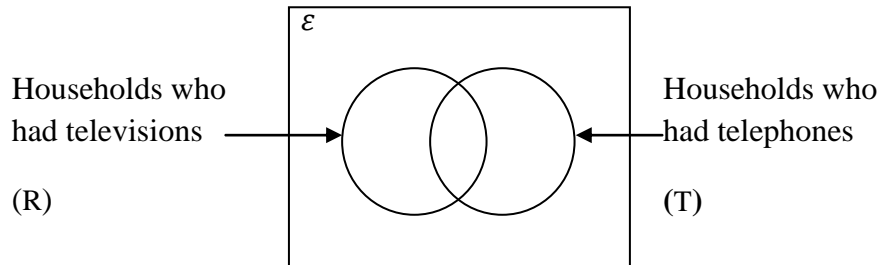
- i. If the total number of students who has been selected languages is 120, how many students has been selected Chinese language?



- ii. If the number of students who has been selected Hindi and French languages are equal, find the angle at the centre of the sector which denote French language.
- iii. After two months, 30 students who has been selected Japanese language changed their subject to French. Find the angle at the centre of the sector which denote Japanese language after this change.

05) A survey conducted in a certain village on 12 randomly selected households revealed the following information.

- 40 households had no televisions.
- 80 households had no telephones.
- 30 households had neither a television nor a telephone.



- Represent the above information on a Venn diagram.
- How many households had both televisions and telephones?
- How many households had either a television or a telephone?
- Shade the region which represent households that had telephone but had no television.
- Represent the shaded region in set notation.

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முழுப் பதிப்புரிமையுடையது]
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බස්නාහිර පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව
மேல்மாகாணகல்விதிணைக்களம்
Western Provincial Education Department

පළමු වාර ඇගයීම - 2018
முதலாவதுதவணைமதிப்பீடு - 2018
First Term Evaluation - 2018

11 ශ්‍රේණිය
தரம் 11
Grade 11

ගණිතය II පත්‍රය
கணிதவினாதாள்--II
Mathematics Paper - II

පැය තුනයි
மூன்றுமணிநேரம்
Three Hours

Important:

- Answer 10 questions by selecting 5 questions from part A and 5 questions from part B.
- Write relevant steps and correct units when answering the questions.
- Each question carries 10 marks.
- The volume of a right cone with the radius of the base r and the height h is $\frac{1}{3}\pi r^2 h$.
- Volume of a sphere with the radius r is $\frac{4}{3}\pi r^3$.

Part A

Answer five (05) questions only.

- 01) i. Simplify. $\log_5 5 + 1$
ii. Find the value without using logarithmic tables.
 $\log\left(\frac{15}{8}\right) + 4 \log 2 - \log 3$
iii. Find the value by using logarithmic tables.
 $\sqrt{8.357} \times 0.895^2$

02) A table of values that can be used to plot the graph of the function $y = x^2 - K$ is given below.

| | | | | | | | |
|---|----|----|----|----|----|---|---|
| x | -3 | -2 | -1 | 0 | 1 | 2 | 3 |
| y | 5 | 0 | -3 | -4 | -3 | 0 | 5 |

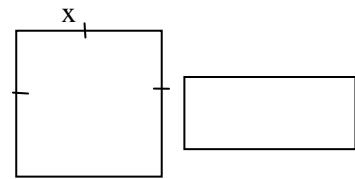
- What value of the graph is represented by K ? Write the value of K using the table.
- By taking 10 small divisions along the x axis and y axis as one unit, plot the graph of the function in a graph paper.
- Write the equation of the axis of symmetry.
- What is the interval of values of x where the graph decreases negatively.
- Using the graph write two characteristics of the graph of the function $y = 4 - K^2$

- 03) A frequency distribution prepared using the data on the number of bundles of winged beans each weight 250g, which was brought to a certain vegetable collection center by 3 farmers during a month is given below.

| | | | | | | | |
|------------------------------------|-------|-------|-------|-------|-------|-------|-------|
| No of bundles brought during a day | 30-32 | 33-35 | 36-38 | 39-41 | 42-44 | 45-47 | 48-50 |
| No of days (f) | 1 | 2 | 5 | 10 | 8 | 3 | 1 |

Calculate the mean number of bundles of winged beans brought to the center to the nearest whole number. If the selling price of a bundle is Rs. 30 and if the farmers issue bundles of winged beans 300 days per year, calculate the annual income received by a farmer.

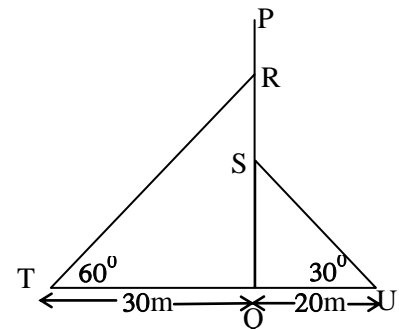
- 04) The length of the rectangular shaped lamina is 5cm more than the length of the square shaped lamina and the breadth of it is 3cm less than the length of the square shaped lamina. If the length of the square shaped lamina is x ,



- Buildup an algebraic expression for the length of the rectangular shaped lamina.
- Buildup an algebraic expression for the breadth of the rectangular shaped lamina.
- If the area of the rectangular shaped lamina is 105cm^2 , show that $x^2 + 2x - 120 = 0$
- Solve the above quadratic equation and find the length and the breadth of the rectangular lamina separately.

- 05) (a) $2x + 3y = 190$
 $3x + y = 180$ Solve the linear simultaneous equations.
- (b) Expand $(x + 2)^3$ and justify the answer for $x = 5$

- 06) According to the figure, PQ is an 80m tall post. Two cables were tied from the points R and S to the points T and U which are on the ground.



- By taking 1cm to represent 10m represent the above information in a scale diagram.
- Find the actual length of RT and SU cables.
- Measure and write the angle of elevation of P, from T.
- Wikum who is at R, observes a point Y which is 30m away from Q which is situated on the side U. Find the angle of depression of Y from R.
- Explain how to obtain the length RY without measuring it.

Part B

Answer five questions only

07) At a drill display the students were lined up in such a way that there are 4 children in the first row and the next row there are 3 more students than the first row and so on.

- i. Write in order the number of students in the first four rows.
- ii. What type of a progression is this?
- iii. How many students are in the n^{th} row?
- iv. Which row has 46 students?
- v. If there are 20 rows in the drill display, find the total number of students in it.

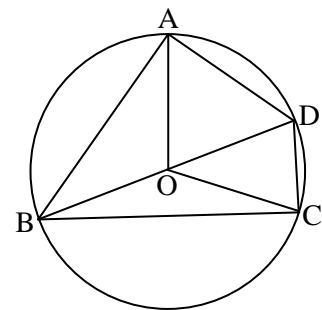
08) By using the straight edge with the scale cm/mm and the pair of compasses and showing the construction lines clearly do the following constructions.

- i. Construct the triangle ABC, where $AB = 6 \text{ cm}$, $\widehat{CAB} = 60^\circ$ and $AC = 5 \text{ cm}$.
- ii. Construct the perpendicular bisector of BC and mark the intersection point of it and the line BC as O.
- iii. Mark a point D on the perpendicular bisector at the opposite side of A, such that $OD = 4 \text{ cm}$.
- iv. Write the special name that can be used for the triangle BCD.
- v. Construct the circle with the centre O and the radius OC.

09) In the parallelogram PQRS, bisectors of \widehat{PSR} and \widehat{SRQ} meet at the point T which is on PQ. Draw a diagram and mark the above data on it. Show that $\widehat{PQR} = 2\widehat{RQT}$ and $\widehat{STR} = 90^\circ$.

10) :a) The bisector of the angle \widehat{ABC} is BD. BOD is the diameter of the circle with the centre O. If $\widehat{ABO} = x$, find the value of following angles in terms of x.

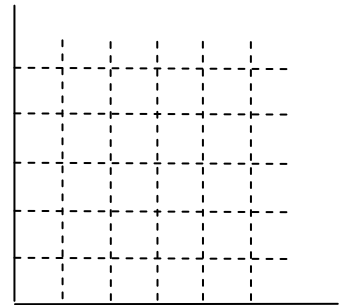
- i. \widehat{ABC}
- ii. \widehat{AOD}
- iii. \widehat{AOC}
- iv. \widehat{ADB}



(b) Show that $\widehat{ABC} + \widehat{ADC} = 180^\circ$.

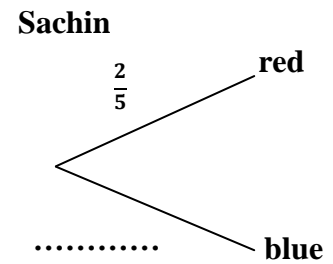
11) (a) In a box there are 2 red pens and 3 blue pens. Sachin took a pen randomly out of the bag marked the colour and replace it. Then Anju takes a pen randomly out of the bag.

- i. Mark the sample space of the experiment on the grid and find the probability of both of them getting same colour of pens.
- ii. Find the probability of both of them getting different colour of pens.



(b)

- i. Complete the following tree diagram to represent pen taken by Sachin.
- ii. Extend the tree diagram to represent the pen taken by Anju and mark the relevant probabilities on the branches.
- iii. Find the probability of both of them getting a blue colour pen.



12) (a) A solid metal cone with the radius of base $3a$ and the perpendicular height $4a$ is melted to make metal spheres with the radius a . Show that 9 such spheres can be made using the metal cone.

(b) If the volume of the cone is $12\ 936\text{cm}^3$, find the radius of the sphere.