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Western Provincial Education Department

දෙවන වාර ඇගයීම - 2018  
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Second Term Evaluation - 2018

10 ජීවීය  
තරම 10  
Grade 10

ගණීතය 1 පත්‍රය  
කළු ත්‍රිත්විනාතාර් - 1  
Mathematics Paper - I

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ඩිස්තෝම් තොරතුව  
Two Hours

Name/ Index No -----

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Signature of Invigilator

Important:

- This paper consists 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	
1	
2	
B 3	
4	
5	
<b>Total</b>	

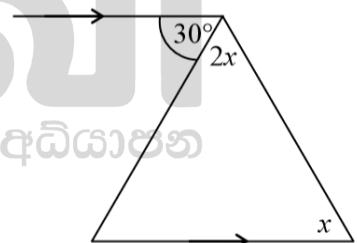
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**Part A**

**Answer all the questions on this paper itself.**

1. Select and underline the nearest value for  $\sqrt{7}$ .  
i. 2.5      ii. 2.6      iii. 2.7      iv. 2.4
2. How many kilometers does a train travels in 15 minutes, if it is travelling at a uniform speed of 72 kilometers per hour?
3. Express in index form.  $\log_2 32 = 5$
4. Simplify.  $\frac{3}{4y} - \frac{1}{2y}$

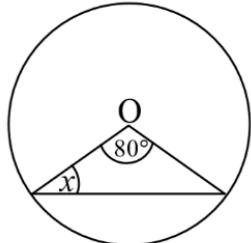
5. According to the information given in the figure, find the value of  $x$ .



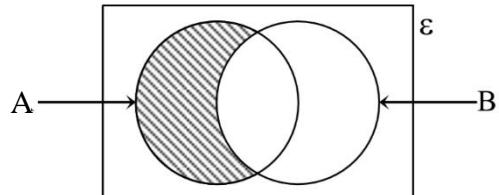
6. If a person who borrowed Rs. 2 500 for annual simple interest, pays Rs. 250 as the interest at the end of the year, find the annual simple interest rate.
7. Find the least common multiple of the algebraic terms  $a^2$ ,  $2ab$ .

8. How much is  $\frac{2}{3}$  of Rs. 975?

9. According to the information given in the circle with the center O, find the value of  $x$ .



10. Write the shaded region in set notation.

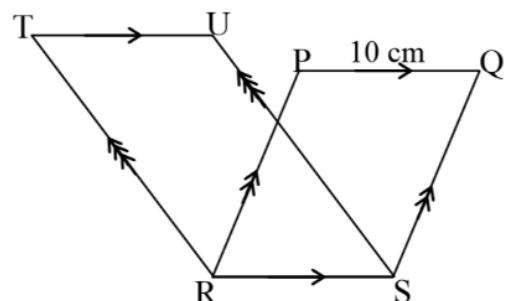


11. Factorize.  $x^2 + 9x + 8$



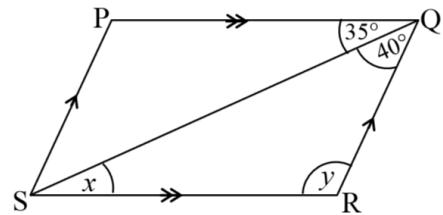
12. In a bag there are 5 orange flavored toffees and 4 mango flavored toffees. When a toffee is taken randomly from the bag, find the probability of that toffee being a mango flavored one.

13. According to the information given, find the length of TU.



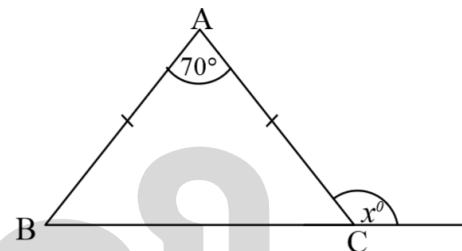
14. Solve.  $(a + 3)(a - 2) = 0$

15. According to given information, find the values of  $x$  and  $y$  in the parallelogram PQRS.

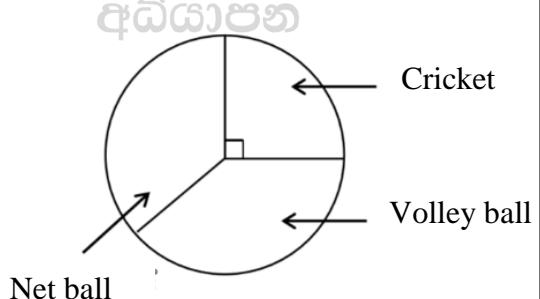


16. Capacity of a water tank which is used to supply water to a certain housing scheme is  $3600\text{ l}$ . If the water is supplied at a rate of  $18\text{ l}$  per second, how many seconds will it take to empty the tank?

17. According to the information given in the figure, find the value of  $x$ .

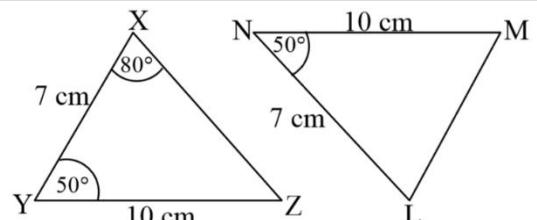


18. The figure shows an incomplete pie chart drawn using the information collected by 40 students in a certain class, regarding their favorite sport. According to that find the number of students who prefer cricket.

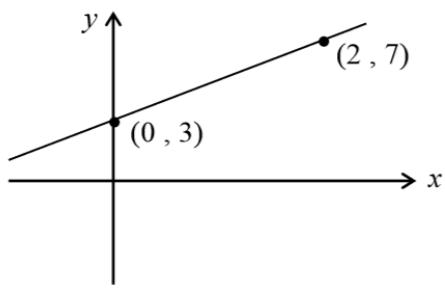


19. If  $x = 2$ , find the value of  $y$  in  $x + 2y = 8$ .

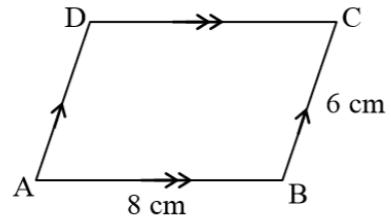
20. The triangles XYZ and LMN are congruent. Write the case of congruency and write the magnitude of  $\hat{NLM}$ .



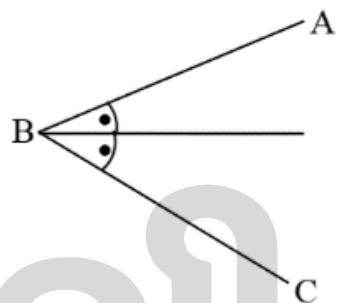
21. Find the gradient of the given straight line.



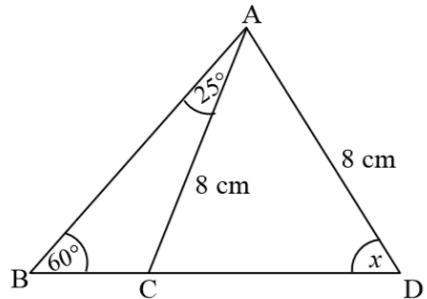
22. According to the information given in the figure, find the perimeter of the parallelogram ABCD.



23. An incomplete sketch drawn to obtain the location of a point P, which is equidistant to the lines AB and BC and equidistant to the points B and C is given below. Sketch the relevant constructions and mark the point P.



24. In the given figure,  $AC = AD = 8\text{cm}$ . Find the value of  $x$ .



25. Solve.  $\frac{3}{2x} = 5$

## Part B

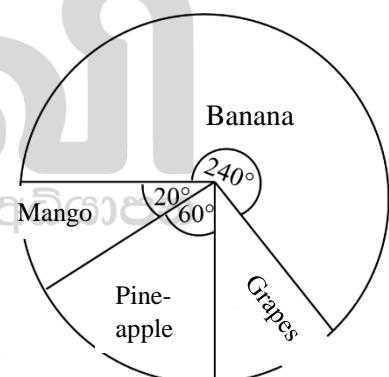
**Answer all the questions on this paper itself.**

01. A man bought some mangoes for Rs. 30 each.  $\frac{1}{5}$  of it was rotten.

- What fraction of the whole lot is not rotten?
- If he kept  $\frac{1}{4}$  of the mangoes which are not rotten for his consumption, what fraction of the whole lot is kept for his consumption?
- He sold the remaining mangoes. If the number of mangoes he sold is 60, how many mangoes did he buy?
- If the number of mangoes he sold is used to manufacture jam, the manufacturing cost of a bottle of jam is Rs. 250. If a value added tax (VAT) of 15% is charged for a bottle of jam, what will be the selling price of a bottle of jam?

02. Following pie chart depict the land area allocated to cultivate different types of fruit in a certain garden.

- Which fruit is cultivated in least extent of land?
- Find the ratio of land area allocated to cultivate mango and banana.



- What fraction of the whole land is used to cultivate banana?
- If the extent of land used to cultivate grapes is  $60\text{m}^2$ , find the area of the whole garden.
- Find the area of the land used to cultivate pine-apple.

03. (a) 3 men who work 6 hours per day, take 2 days to build a parapet wall.

- How many man hours are needed to build the wall?
- How many days will it take for two men who work 9 hours per day, to complete the same work?

(b) When a car is imported 15% of its value has to be paid as duty. The imported value of the car is Rs. 750 000.

- What is the value of the car after paying the duty?
- At what price should the car be sold to make a profit of 12% ?

04. In a netball team there are 7 equally talented players. Four of them are wearing caps, two of them are wearing red colour belts and one is wearing black socks. By taking those who wear caps as A1, A2, A3, A4, those who wear red colour belts as B1 and B2, the one who wear black socks as C1,

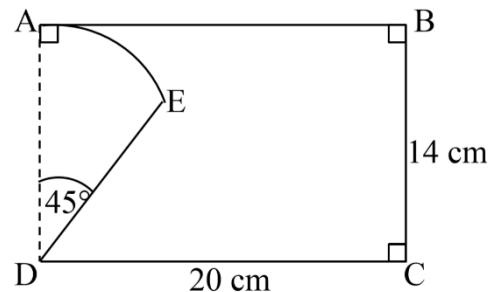
- Write the sample space ( S ) to represent all the players of the team.

If a player is selected randomly,

- Find the probability of that person being a one who wears a cap.
- Find the probability of that person being a one who wears black socks.
- Find the probability of that person being a one who wears a red belt or black socks.
- Find the probability of that person being a one who wears a red belt but not a cap.

05. As shown in the figure, AED sector is removed from the ABCD rectangular shaped metal lamina.

- What is the radius of the sector?
- Find the perimeter of ABCDE metal lamina.



- Find the area of the ABCDE metal lamina.
- If instead of removing ADE sector, a right angle triangular portion ADF where F is situated on the line AB and equal in area of ADE is removed from the rectangle, draw the sketch of the newly obtained lamina on the same diagram and write the special name in which the shape is called.
- Find the AF length.

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Second Term Evaluation

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තරම්  
Grade ] 10

විෂයය  
පාඨම්  
Subject ] Mathematics

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විණාත්තාව  
Paper ] II

කාලය  
කාලම්  
Time ] 3 hours

- ❖ Answer 10 questions selecting 05 questions from part A and 05 questions from part B.
- ❖ Each question carries 10 marks.

### Part A

**Answer 05 questions only.**

1. (a) The annual assessed value of a house which lies within the limits of a certain municipal council which charges 12% of annual rates is Rs. 18 000. The house owner is rented it for monthly rental of Rs. 10 000.

- i. What is the annual rates that should be paid for the house?
- ii. What is the annual income the house owner gains by renting the house?
- iii. If Rs. 10 000 should be allocate for the maintenance of the house, find the net profit he gains after paying the tax.

- (b) If a person who loaned some money for annual simple interest rate of 12% paid Rs. 2 160 as the interest after 3 years, find the amount he loaned.

2. An incomplete table of values which is used to draw the graph of the function  $y = 2x^2 - 9$  is given below.

$x$	-3	-2	-1	0	1	2	3
$y$	9	.....	-7	.....	-7	-1	9

- i. Fill in the blanks in the table.
- ii. Using a suitable scale, draw the graph of the function.

Using the graph,

- iii. Find the minimum value of the function.
- iv. Write the equation of the axis of symmetry.
- v. Write the range of values of  $x$  where the function decreases positively.

3. In a box there are red and blue colour balls. When the twice of the number of red colour balls is added to the three times of number of blue colour balls, the answer is 37. When the two times of the number of blue colour balls is subtracted from the four times of the number of red colour balls the answer is 18. By taking the number of red colour balls as  $x$  and the number of blue colour balls as  $y$ ,

- Using the above information build up two simultaneous equations.
- By solving the two equations, find the number of red colour balls and number of blue colour balls in the box separately.
- When  $\frac{1}{3}$  of the total number of balls in the box is put into a bag, the number of balls in the bag became  $a$ . By taking the number of balls in the box as  $p$ , write down a relationship including  $a$  and  $p$ .

4. If the area of the rectangle ABCD where  $AB = (2x + 1)\text{cm}$  and  $BC = (x + 2)\text{cm}$  is  $77\text{cm}^2$ , build up an quadratic equation including  $x$  and find the length of AB.

5. Information on the number of coconuts plucked from 30 coconut trees in a certain coconut estate is given in the following table. (6 -10 means greater than or equal to 6 and less than 10)

Class Interval (No of coconuts)	Frequency (No of trees)
6 - 10	5
10 - 14	8
14 - 18	10
18 - 22	4
22 - 26	3

- Using  $mean = \frac{\sum fx}{\sum f}$  where the mid value is denoted by  $x$ , calculate the mean number of coconuts plucked from a tree to the nearest whole number.
- Explain by giving reasons that the number of coconuts plucked from the state exceeds 350.

6. Length, breadth and height of a cuboid shaped empty tank is 5m, 4m and 3m respectively.

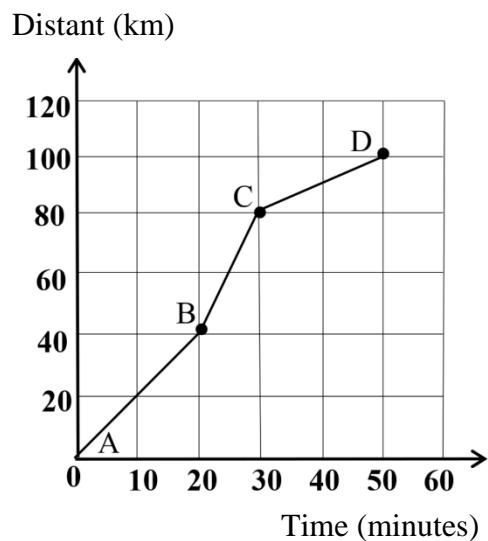
- Calculate the volume of it in liters.
- Water flows into the tank at a uniform rate of  $350l$  per minute and water flows out of the tank at a uniform rate of  $300l$  per minute. How many hours will it take to fill the tank completely?
- Find the height of the water in the tank after 45 minutes, in centimeters.

## Part B

Answer 05 questions only.

7. A distance-time graph of the motion of an intercity train is given in the figure.

- i. What is the total distance traveled by the train?
- ii. What is the time taken by the train to complete the journey?
- iii. Find the speed of the train in AB, BC and CD parts separately, in kilometers per hour.
- iv. Find the average speed of the train.



8. i. Find the value.  $\log_{10} 25 + \log_{10} 4 - 1$

ii. Solve.  $\log_2 x = \log_2 5 + \log_2 4$

iii. Find the value using logarithmic tables.

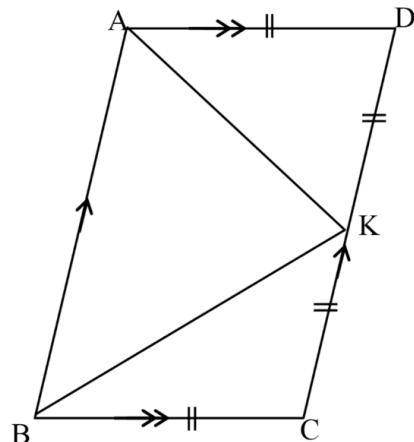
9. Using only the straight edge and the pair of compasses do the following constructions. Show the construction lines clearly.

- i. Construct a line segment where  $PQ = 7\text{cm}$ .
- ii. Construct  $P\widehat{Q}R$  such that,  $QR = 6\text{cm}$  and  $P\widehat{Q}R = 120^\circ$ .
- iii. Construct the perpendicular bisectors of the sides  $PQ$  and  $QR$  and mark the intersection point of them as  $O$ .
- iv. Name the meeting points of the above perpendicular bisectors and  $PQ$  and  $PR$  as  $S$  and  $T$  respectively. Construct a circle with the centre  $O$  and radius  $OS$ . Measure and write the radius of the circle.

10. In the ABCD parallelogram, mid-point of the side DC is K.  $AD = DK$  and  $BC = CK$ . Copy the diagram on your answer sheet.

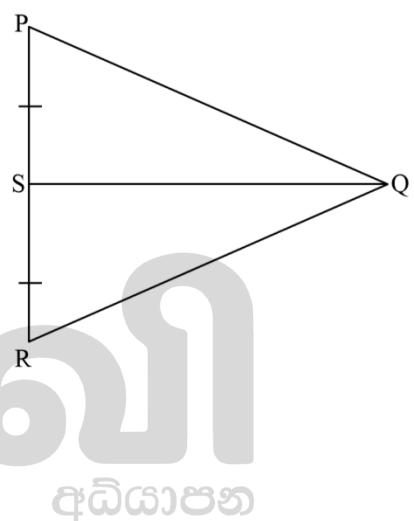
- Show that  $\hat{B}AD$  is bisected by AK and  $\hat{ABC}$  is bisected by BK.
- Show that  $\hat{AKB} = 90^\circ$ .
- Draw KX parallel to DA and meets the line AB at X. Show that,

$$\text{Area of } \triangle AKB = \frac{1}{2} \text{ Area of } \square ABCD$$



11. In the triangle PQR shown in the figure, mid point of the side PR is S and  $\hat{SPQ} = \hat{SRQ}$ . Copy the diagram on your answer sheet.

- Congruent the triangles PQS and SQR and show that  $QS \perp PR$ .
- When PR is produced to T, if  $\hat{PQS} = x$ , write the magnitude of  $\hat{QRT}$  in terms of  $x$ . ( Give reasons)



12. (a)  $\varepsilon = \{ 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 \}$

$A = \{ 3, 6, 9 \}$

$B = \{ 2, 4, 6, 8, 10 \}$

- Represent the above information on a Venn diagram.
- Find  $n(A' \cap B)$ .

(b) Number of cricket players in a certain sports club is 25. Number of football players are 28. Every member do at least one of the above sports. 8 do both sports mentioned above. There are no other sports in this sports club.

- Represent the above information on a Venn diagram.
- How many members are there in the sports club?
- How many members do not play football?