

SECOND TERM TEST – 2019 JULY

MATHEMATICS - I

Time 2 hour

Name :

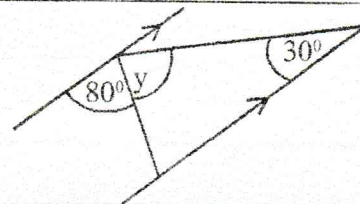
Caution :

- Part I – A : Answer all the equations. 2 marks are given to each equation
- Part I – B : Answer all the questions. 10 marks are given to each question

Part I - A

- Answer to all the questions

- 1) Find the value of y according to the information given in the figure?



- 2) Simplify. $\frac{3}{2ab} - \frac{5}{4ab}$

- 3) Find the least common multiple of $3xy$, x^2

- 4) Circle the first approximation of $\sqrt{10}$

i. 3:1

ii. 3:2

iii. 3:3

iv. 3:4

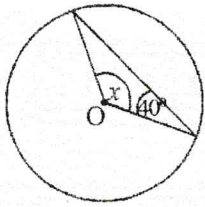
- 5) Amal borrowed Rs. 5000 for annual simple interest of 12%. What is the annual interest that he has to be paid?

- 6) What is the distance does a vehicle travels in 20 minutes, if it is travelling at a uniform speed of 60 kmh^{-1} ?

- 7) Express in log form. $25 = 5^2$

- 8) Factorize. $x^2 + 6x - 7$

9)



Find the value of x according to the information given in the circle. In here, O is the center.

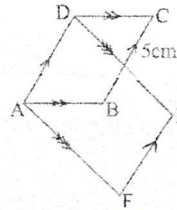
10) Solve.

$$(x - 3)(x - 7) = 0$$

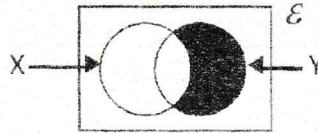
11) Simplify.

$$\frac{2}{5} \text{ of } 125$$

12) If $ABCD$ and $AFED$ are parallelograms, what is the length of EF ?



13) Write the shaded region in set notation.

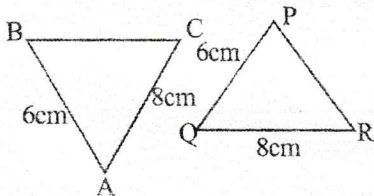


14) There are 3 red pens and 5 blue pens in a bag. When a pen is taken randomly from the bag, find the probability of that pen being a red one.

15) Find the value of a in $3a + b = 7$, when $b = 4$.

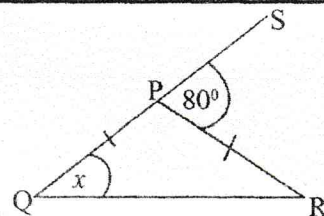
16) Water is driven out through a pipe at a rate of 15 liters per second from a water tank. The capacity of the tank is 3000ℓ. How many seconds will it take to empty the tank if the tank is fully filled with water?

17)

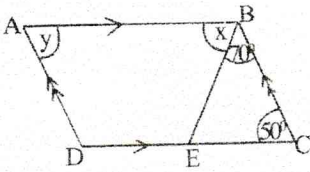


Write the condition to triangles ABC and PQR being congruent under the case of S.A.S?

18) Find the value of x according to the information given in the figure.

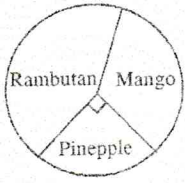


19)



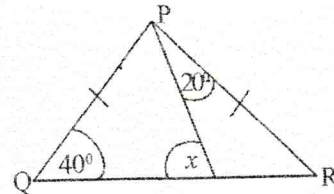
ABCD is a parallelogram. Find the values of x and y according to the given information.

20)

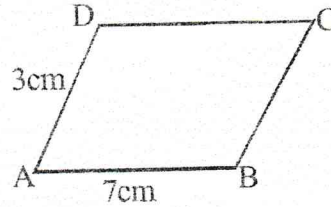


An incomplete pie-chart drawn using the information collected by students in 10 A class, regarding the preference of fruits. If 18 students prefer to pineapple, how many students are there in the class?

21) According to the information given in the figure, find the value of x



22) ABCD is a parallelogram. Find the perimeter of it.

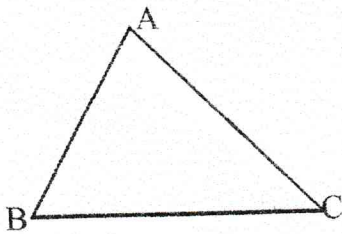


23) If a straight line passes through the points $(0, -1)$ and $(3, 5)$, find the gradient of it.

24) Solve.

$$\frac{8}{x} - 1 = 3$$

25)



ABC is a triangular flower bed. It is necessary to fix a tap Q, which is equidistant to the boundaries BC and AC and equidistant to the corners A and C. Sketch the relevant constructions and mark the tap Q.

Grade 10 Mathematics
Part I – B

• Answer all the questions on this paper itself

1) a) Nimal gave $\frac{1}{5}$ th of plucked coconut in his land to his brother. He kept $\frac{1}{3}$ rd of the remaining coconuts for his consumption. Then he sold the rest.

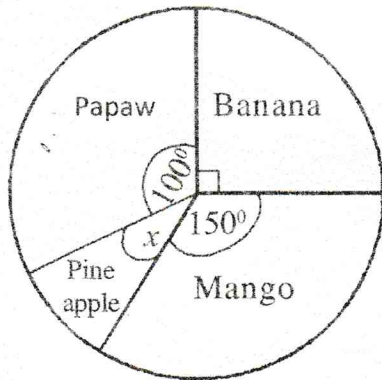
(i) What fraction of the whole lot is remaining after giving to his brother?

(ii) What fraction of the whole lot is kept for his consumption?

(iii) If he sold 960 coconuts, how many coconuts did he pluck from the garden?

b) Nimal bought an electric coconut scraper worth Rs. 5000. If a value added tax (BAT) of 10% is charged on it, what was the buying price of it?

2) Following pie-chart depicts different types of fruits used in a fruit Dansela.



(i) Find the value of x

(ii) Find the ratio of used papaw and mango.

(iii) If 540 bananas are used in here, how many mangoes are used in there?

(iv) If the cost of one pineapple was Rs. 200, find the money spent to buy pineapples.

3) a) 10 men take 6 days to dig a drain.

(i) How many mandays are needed to dig the drain?

(ii) After 2 days, 2 men did not come to work. How many extra days the remaining men need to complete the work?

b) Nihal deposits Rs. 10 000 in a bank which pays 6% simple annual interest rate.

(i) What is the interest per year?

(ii) If he withdraws the deposited money and the interest at the end of 3 years, how much will he get as the total?

4) There are 3 red beads, 2 yellow beads and one green bead in a bag. Mala takes out one bead randomly from the bag and gives it to her friend Neela. Then again, she takes out another bead randomly and keeps it to her. By taking 3 red beads as R_1, R_2, R_3 , 2 yellow beads as Y_1, Y_2 and green bead as G ,

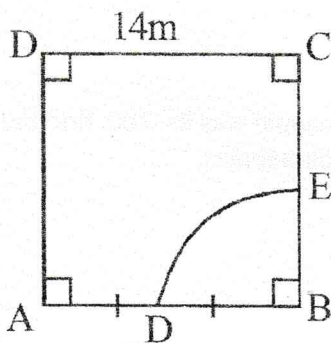
(i) Draw the sample space on the grid, showing all possible colours of beads that Mala and Neela take.

(ii) Find the probability of Neela getting a yellow bead.

(iii) Find the probability of both getting the same colour beads.

(iv) Find the probability of only Mala gets red colour bead.

5) As shown in the figure, ABCD is a big square garden. BDE sector is a pond.



(i) Find the arc length DE.

(ii) Find the area of the pond.

(iii) Find the simplest ratio of area of pond and area of garden.

(iv) It is decided to build a CDF triangular shaped play area such that area of it is equal to the area of pond, DC is one boundary of it and F lies on AD. Show the location of F with measurements.

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- Answer 5 questions in part A and 5 questions in part B. For each question 10 marks are given

Part II - A

- 1) a) If the total amount that had to be paid after some years to settle a loan of Rs. 50 000 at an annual simple interest rate of 7% was Rs. 60 500, find the time duration spent to settle the loan.
- b) The value of a vehicle in India is Rs. 1 000 000. 60% duty is charged on it when importing it to Sri Lanka.
- (i) What is the duty?
(ii) What is the value of the vehicle with duty?

- 2) An incomplete table to draw the graph of the function $y = 4 - x^2$ is given below.

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

- (i) Find the value of y when $x = 0$
(ii) Taking 10 small divisions as one unit along the x and y axes, draw the graph of the function.

According to the graph,

- (iii) What is the maximum point?
(iv) Write the equation of the axis of symmetry
(v) Write the coordinates of the turning point
(vi) Write the range of x when the function is positive

- 3) (i) If $x + y = 5$ and $xy = 3$, find $x^2 + y^2$
(ii) Solve pair of simultaneous equations

$$3x - y = 7$$

$$2x + 3y = 1$$

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

- 4) a) Factorize

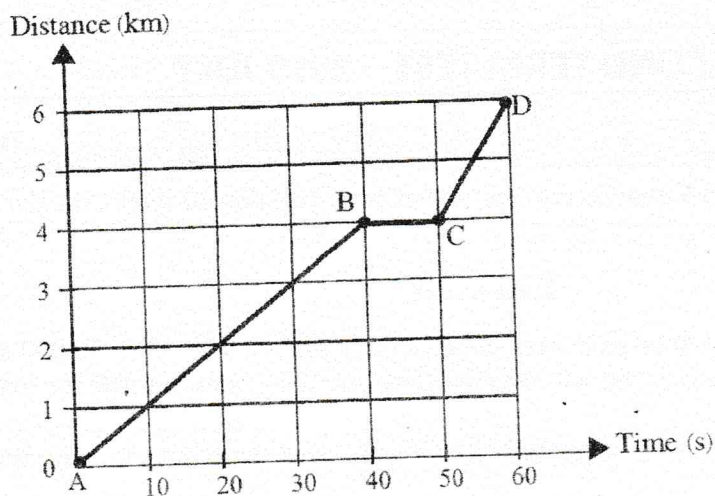
(i) $4x^2 - 16$

(ii) $x^2 + 2x - 35$

- b) Find the value of 101×99 by using the knowledge of factors

- c) Find the roots. $(x-1)(x+8) = 0$

- 5) A distance-time graph illustrated the motion of a boy who cycled to the school is given below. On the way to the school, he met a friend and spent some time to talk with him



- (i) What is the distance travelled by him before he met the friend?
 (ii) How long did it take him to meet the friend?
 (iii) Find the distance between his house and school
 (iv) Calculate the speed which he travelled from A to B in kilometers per hour
 (v) If he didn't meet the friend, calculate the average speed of the bicycle in kilometers per hour.
- 6) (i) Find the value of $\log_5 125 + \log_3 81 - 3$
 (ii) Solve. $\log_7 8 + \log_7 x = \log_7 16 - \log_7 2$
 (iii) Find the value using the logarithms table.

$$\frac{4.98 \times 310.8}{20.17}$$

Part II – B

- Answer 5 questions only.

7) 3, 7, 11, 15, ... shows a number sequence.

- (i) Write the next two terms
 (ii) Find the general term of the above number sequence
 (iii) Find the 20th term of the number sequence using the general term
 (iv) Which term is 63 in this number sequence?
 (v) Is 120 a term of this number sequence? Give reasons.

8) Use only a straight edge with a cm/mm scale and a pair of compasses for the following constructions:
 Show the construction lines clearly.

- (i) Construct the triangle ABC such that $AB = 6\text{cm}$, $BC = 8\text{cm}$ and $\hat{A}BC = 90^\circ$
 (ii) Construct the locus of points moving at an equal distance from point A and C
 (iii) Name the point of intersection of the above locus and the produced AB as D
 (iv) Join CD. Write the type of triangle ACD with reasons.

9) the following frequency distribution is prepared from the information on the lengths of waste wires in a factory.

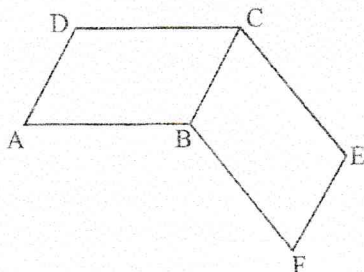
Length of waste wire (cm)	Mid value (x)	Number of wires Frequency (f)	fx
10 – 15		25	
15 – 20		8	
20 – 25		12	
25 – 30		30	
30 – 35		10	
35 - 40		15	

(Assume that 10 – 15 group consists of 10 or above 10 and less than 15 centimeters)

- Write the modal class
- Complete the table
- Find the mean lengths of waste wire
- How many pieces of waste wires were less than 25 centimeters?
- If one piece of waste wire is selected at random, what is the probability of it to be 30 centimeters or more long one?

10) a) Write 2 special properties of a rhombus

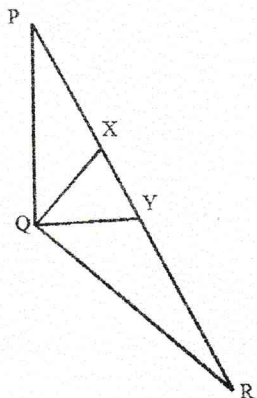
b) In following figure, ABCD and BCEF are two parallelograms.



- Prove that AFED is a parallelogram
- Show that

$$\text{Area of parallelogram AFED} = 2 \times \text{Area of triangle AEF}$$

11)

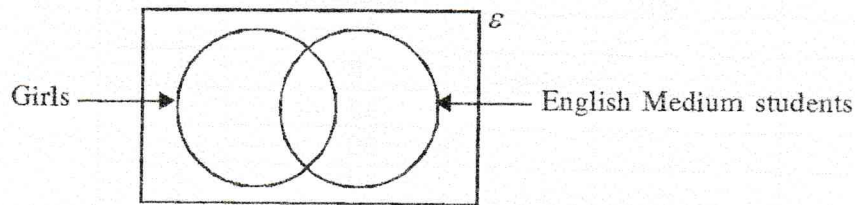


In the triangle PQR in the figure, $PQ = QR$. The points X and Y are on PR such that $PX = RY$.

- Show that $\triangle PQX \cong \triangle QRY$

- Show that QXY is an isosceles triangle
- If $\hat{QXY} = 70^\circ$, find \hat{XQY}

- 12) There are 100 students in grade 11 in a school. 10 girls study in English medium. There are 35 students who study in English medium. 35 boys study in Sinhala medium. An incomplete Venn diagram drawn to include the above information.



- (i) Copy and complete the Venn diagram
- (ii) Shade the region which shows girls who study in Sinhala medium
- (iii) How many boys are there who study in English medium?
- (iv) How many girls are there who study in Sinhala medium?