PROVINCIAL DEPARTMENT OF EDUCATION NORTH WESTERN PROVINCE

THIRD TERM TEST - 2019
MATHEMATICS - I

Grade 11　　　　　　　　　　　　　　　　　　　　　　**02 Hours**

Name / Index No. :

- **Answer all questions on this itself.**
- **Each questions carries two marks in Part A and 10 marks for each questions in Part B.**

PART - A

01.　　Rs. **13 800** was charged as the custom duty, when a washing machine worth Rs. **46 000** was imported. Find the percentage that was charged as custom duty.

02.　　Simplify,　　$\dfrac{5}{3b} - \dfrac{1-b}{b}$

03.　　A sector of a circle **PQR** is cut and removed from a square shape lamina. The remaining potion is shaded. If the arc length of **PR** is **22cm**, calculate the side length of the square shape lamina.
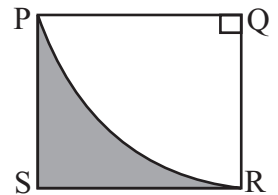
04.　　According to the data marked on the quadrilateral **PQRS**, Name a pair of congruent triangles & mention the case of congruency.
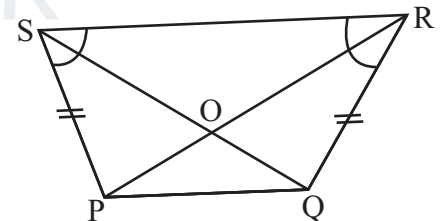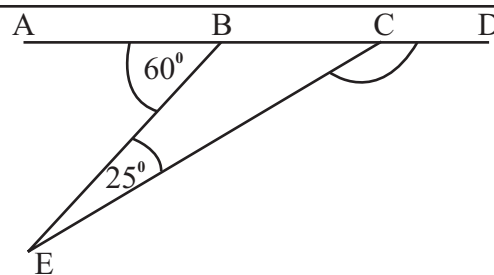

05.　　The Distance - Time graph of the motion of a bus is given below. Calculate the speed of the bus within last **30** minutes.
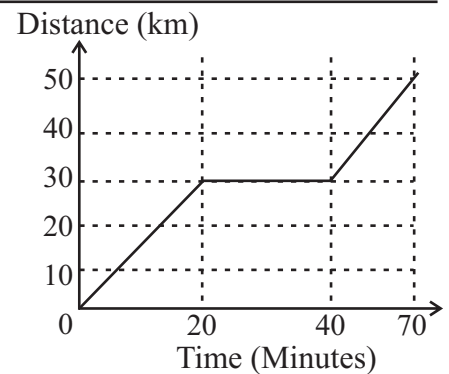
06.　　Find the **LCM** of **8mn, 6m²** and **4m**.

07. Write $\log_{10} 56.3 = 1.7505$ in index notation.

08. **ABCD** is a straight line. According to the given data, find the magnitude of $E\hat{C}D$.

09. A certain task can be completed in **3** days by **12** men. It is expected to complete twice the task like the initial task in **8** days. Find how many men are required to complete the second task in **8** days.

10. Factors of $6x^2 - 7x + 2$ can be represented as .... $6x^2 - 7x + 2 = (2x - 1)(ax + b)$.

Find the value of a and b.

11. The square root of a certain number to the first approximation is **4.5**. Select the relavant number from the followings,

               16   **18**   **20**   **21**

12. **AB** and **BC** are **2** chords of the circle with the centre **O**. The midpoints of the above 2 chords are **X** and **Y** respectively. If $X\hat{O}Y = 115^0$. Find the magnitude of $A\hat{B}C$.
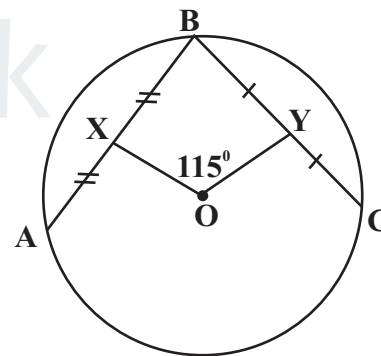
13. Solve, $\dfrac{1}{2} x (x + 1) = 0$

14. An equilateral triangle can be obtained by joining **A, B** and **C** points on the circle with the centre **O**. Find the magnitude of $A\hat{B}O$.
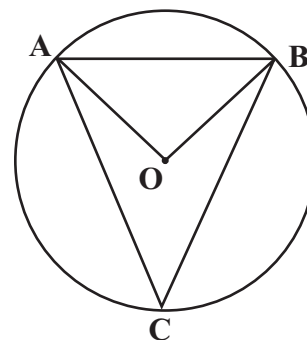
15. **AB** is a straight line, shown in the given cartesian plane,

    (a)   Find the intercept.

    (b)   Find the gradient.
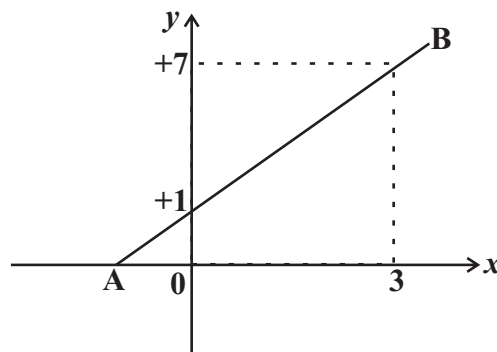
16.   **ABC** is a right angled triangle. According to the given data $\tan \hat{C} = \dfrac{3}{4}$. So what is the trigonometric ratio which represents $\dfrac{3}{5}$.
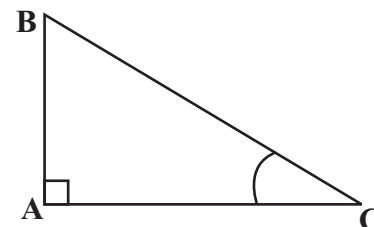
17.   Write the elements of the set $(A \cap B)^I$.
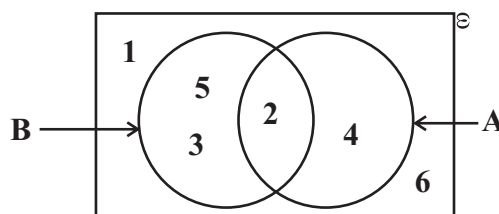
18.   Based on the information given in the diagram,

    (i)   Write the relation between **AB** and **XY**.

    (ii)   If $X\hat{B}Y = 55^0$, find the magnitude of $A\hat{C}B$.
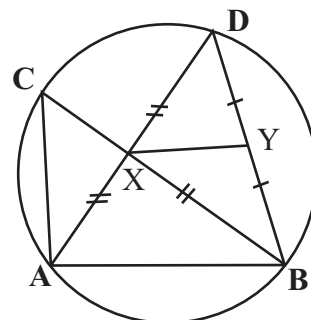
19.   Find the value of x and y if.

$$2\begin{bmatrix} 3 & 4 \\ -1 & 0 \end{bmatrix} + \begin{bmatrix} -1 & 4 \\ 2 & y \end{bmatrix} = \begin{bmatrix} x & 12 \\ 0 & 4 \end{bmatrix}$$

20.   The midpoints of the sides **AB, BC** and **AC** of the triangle **ABC** is **P, Q** and **R** respectively. For each statement given below, If it is correct, mark a "✓" in the box in front of it.
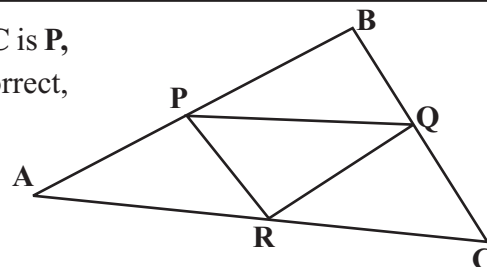
    (1)   Area of the triangle **PQR** is $\dfrac{1}{4}^{th}$ of the area of the triangle **ABC**.   ☐

    (2)   **BPRQ** is a parallelogram.   ☐

    (3)   The perimeter of the triangle **PQR** is $\dfrac{1}{4}^{th}$ of the perimeter of the triangle **ABC**.   ☐

21. The volume of the Cylidrarical shape metal rod with the length **2m** is **2100cm³**. Calculate the area of the cross section in square centimeters.
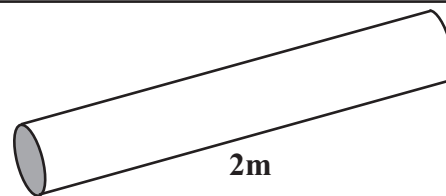
22. **A** and **B** are two mutually exclusive events. If $P(A) = \dfrac{1}{4}$ and $P(B) = \dfrac{1}{3}$, find the value of $P(A \cup B)$.

23. **ABCD** is a cyclic quadrilateral. **AD** and **BC** are produced upto **E** and **F** respectively. **DC//EF** Find the magnitude of x and y using the given information.
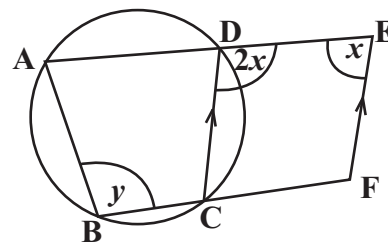
24. **PQ** is the locus of a point moving at a constant distance from a straight line **AB**. Draw a sketch of the construction lines, required to locate the point **M** on **PQ** and equal distance from two fixed points **A** and **Q**.
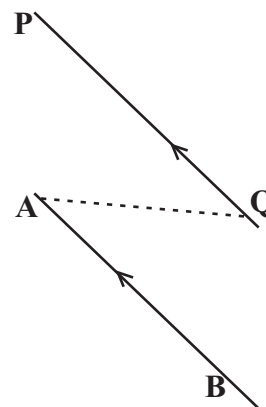
25. The cumulative frequency curve represents information of the number of leaves taken by the employees of a certain office. If the first quatile (Q_1) is **10**, find the interquatile range.

Grade 11 PART - B **Mathematics - I**
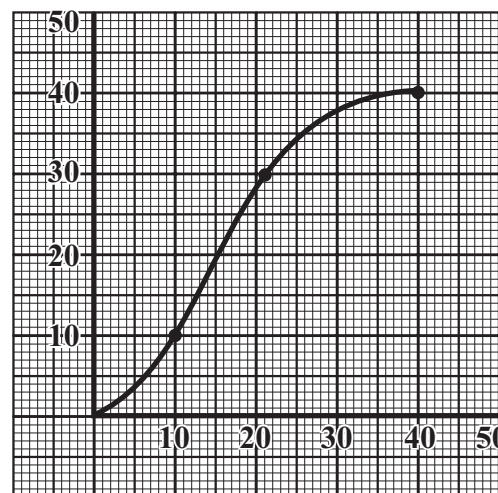
(01) Mr. Sisira spend $\frac{11}{15}$ of the amount of money he earned, to bought a land and built a house. He spend only $\frac{1}{3}$ of the amount of the money he earned, to buy the land.

   (i)   Find what fraction of the total amount was used to build the house.

   (ii)   After spending money to buy the land and build the house, Mr. Sisira spend $\frac{3}{4}$ of the rest of money to buy funitures for the house. What fraction of the total amount of earned money did Mr. Sisra spend to buy furnitures?

   (iii)   At the end of all these expenses, Mr. Sisira deposited the remaining amount of money in the bank. It was $\frac{1}{15}$ of the amount of money he earned. How many times the amount of money spend to buy furnitures when compared to the amount of money deposited in the bank.

   (iv)   If Mr. Sisira deposited Rs. 180 000 in the bank, calculate the total amount of money he earned.

(02) The given figure is a sketch of a wall hanging consisting of a square shape part ABCD and a semi-circular part CED.

   (i)   Write the special name of the shape ABO.

   (ii)   Find the arc length of the semi-circular shape.
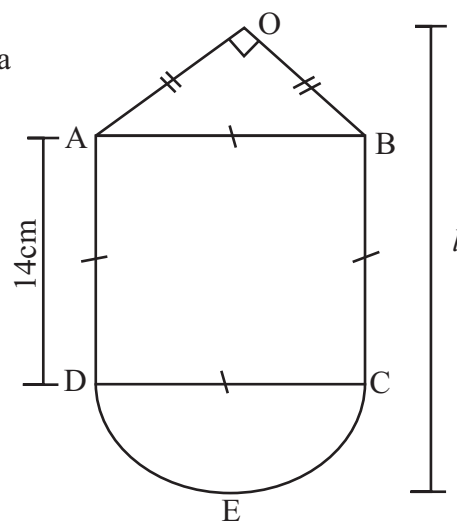
(iii) Show that the ratio between the area of the semi-circular shape to the area of ABCD square shape is 11:28.

(iv) If the area of the shape OAB is 49cm², Calculate the height of the wall hanging.

(03) (a) A public limited company issues 600 000 shares to the public at Rs. 8 per share to raise it's capital. Mr. Suresh purchases 12 000 shares in this company.

(i) Find the amount of money Mr. Suresh invests in this company.

(ii) Express his possession by investing money in the company, as a percentage.

(iii) The company pays Rs. 30 000 dividends income for a year to Mr. Suresh. Find the annual dividends the company paid per share.

(b) A company charged 3% of commission when selling a land.

(i) Calculate the amount of commission paid when selling the land for Rs. 800 000.

(ii) Calculate the remaining amount of money the land owner gets.

(04) (a) There are 2 level in a single player computer game. If the player wins the first level only, can play the second level. If he loses the first level, wants to play the first level again.

The probability of winning the first level is $\frac{4}{5}$ and the second level is $\frac{1}{3}$,

(i) Kasun plays the above computer game twice. An incomplete tree diagram to represent this information is given below. Write down the corresponding probabilities on the branches.

First time   Second time
$\frac{4}{5}$ win   win
          lose   lose
                                 win
                                 lose
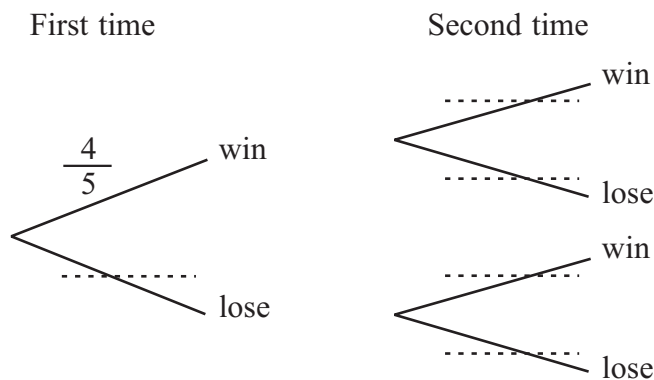
(ii) Using the tree diagram, find the probability that Kasun wins the game in second time.
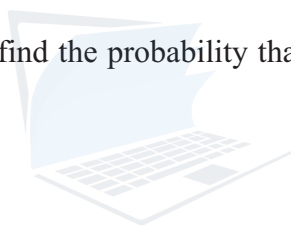
(b) There are 03 games as P_1, P_2, P_3 in Kasun's computer & 04 games as P_1, P_2, P_3 and P_4 in Chamod's computer. Kasun & Chamod randomly select one game and play. Represent the relavant sample space with respect to this random experiment in the gride shown below.

Kasun

Chamod
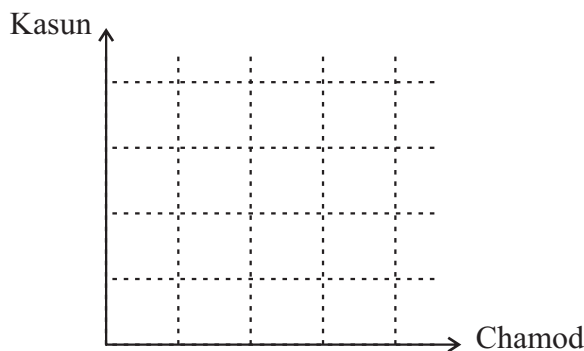
(i) If A is the event of selecting two different games, encircle the elements of A in the grid.

(ii) Find $P(A^1)$.

(05) The pie chart given in the figure shows the marks obtained by certain set of students for the Olympiad maths paper, out of 60 marks.

The number of students who obtained marks between 50 - 60 is 04 and the angle at the centre of the sector is 30^0.
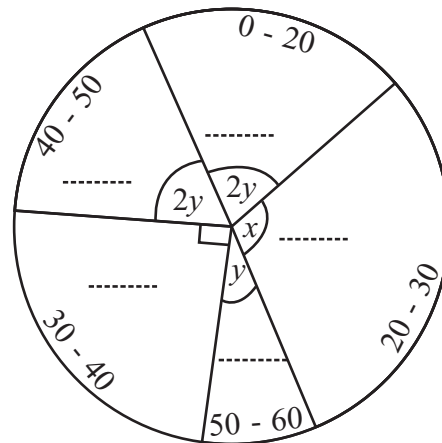
(i) Calculate the magnitude of the angles at the centre of the each sector and write them on the relevant dotted lines given in the pie-chart.

(ii) Find the number of students relavant for the each class interval & fill in the blanks.

0 - 20	20 - 30	30 - 40	40 - 50	50 - 60

(iii) Using the above table, complete the histogram & draw the frequency polygon.
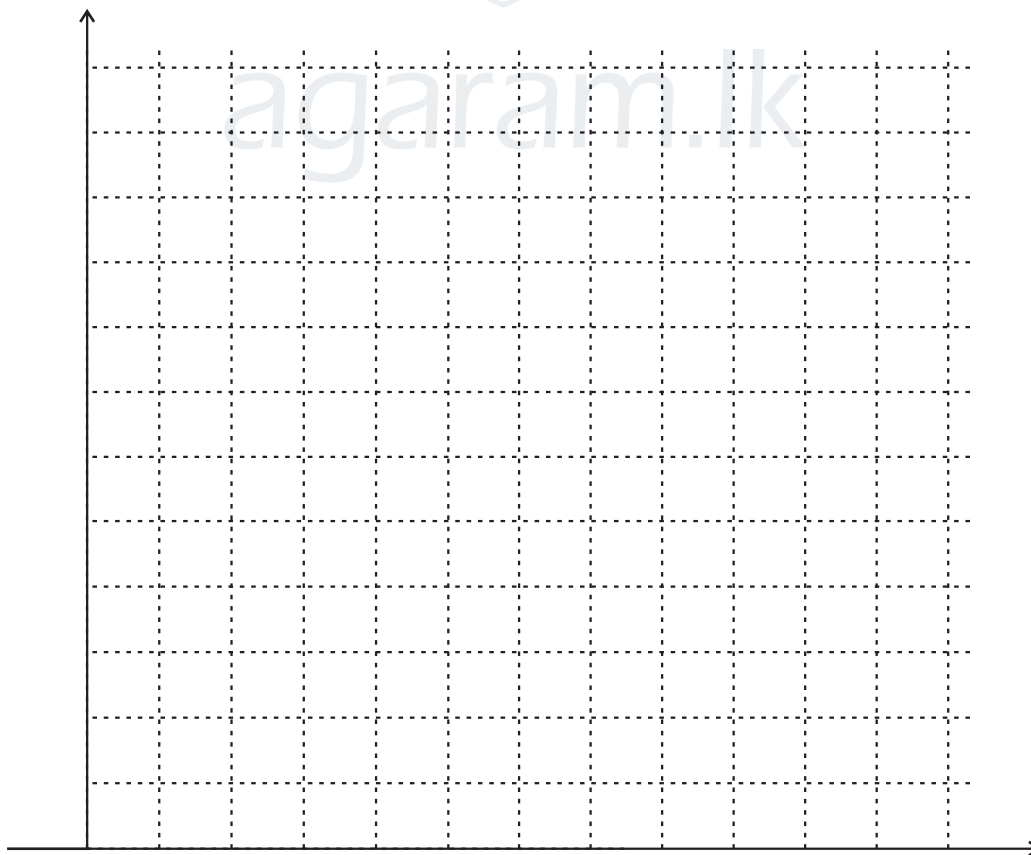
PROVINCIAL DEPARTMENT OF EDUCATION - NORTH WESTERN PROVINCE

THIRD TERM TEST - 2019

Grade 11   # MATHEMATICS - II   **3 Hours 10 minutes**

Name / Index No. :

- **Answer ten questions selecting five questions from part A and five questions from part B.**
- **Each question carries 10 marks.**
- **The volume of a sphere of radius r is $\frac{4}{3} r^3$ and the volume of a right circular cylinder with radius of the cross section r and height h, is r^2h.**

PART - A

(01) (a) An incomplete table of values prepared to draw the graph of the function $y = 3 - (x + 1)^2$ is given below.

x	-4	-3	-2	-1	0	1	2
y	-6	-1	2	....	2	-1	-6

   (i) Find the value of y when $x = -1$.

   (ii) Using a suitable scale draw the graph of the above function.

  (b) Using the graph,

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

   (ii) Write the range of values of x for which the function is decreasing from $+1$ to -4.

   (iii) Using the value of x for which the function is 0, find the value of $\sqrt{3}$.

   (iv) Write down the equation of the graph which is obtained when the above graph is shifted downwards along the y axis by 2 units.

(02) (a) A furniture set priced at Rs. 80 000/- can be purchased by making a down payment of Rs. 8 000 and paying the remainder by 24 equal monthly installments with an annual interest rate of 24%. If the interest is calculated on the reducing balance, find the interest to be paid at the end of 2 years.

  (b) When purchasing the above set of furniture, the remaining amount after paying the down payment can be borrowed to repay in 2 years with a compound interest rate of 13% per year. According to that by which method of purchasing, the customer has to pay a more interest? Reducing balance method or compound interest method? Give reasons.

(03) 3 Youghurts and 4 Ice-creams can be purchased by paying Rs. 220 and 4 Yoghurts and 2 Ice-creams for Rs. 210. The price of a Yoghurt is Rs. x and the price of an Ice-cream is Rs. y.

   (i)   Denote the number of Youghurts and Ice-creams as a square matrix and then denote the price of a Youghurt and the price of an ice-cream as a column matrix.

   (ii)   Construct a pair of simultaneous equations by writing the two matrices in (i) as a product.

   (iii) Solve the pair of simultaneous equations and find seperately the price of a yoghourt and an ice cream.

   (iv) If an equal number of Yoghurts and Ice-creams can be bought for Rs. 260, find the number of yoghurts and icecreams can be bought.

(04) ABC is a triangular shaped lamina with side length of BC is $(x + 2)$ units. The length of AD is twice of the above length. If the area of lamina is 24 square units,
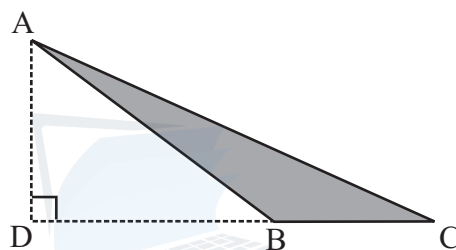
   (i)   Show that the area of lamina satisfies the equation $x^2 + 4x - 20 = 0$.

   (ii)   Solve the equation $x^2 + 4x - 20 = 0$ by using the formula or any other method and show that the length of BC is $2\sqrt{6}$.

(05) The following table contains information on the distance travelled by a car by a certain government field officer to his field study during 25 days of a month.

(2-6 denotes greater than or equal 2km and less than 6km)

Distance (km)	2 - 6	6 - 10	10 - 14	14 - 18	18 - 22	22 - 26	26 - 30
Number of days	2	4	5	7	3	2	2

   (i)   Write the modal class.

   (ii)   Find the mean distance travelled by him by his motor car during this month of 25 days to the nearest kilometer.

   (iii) His institute pays him Rs. 8500 as the transport fee for 25 days. But the officer has calculated that he needs Rs. 24 per 1km each for his motor car. Show that the transportation fee that is paid by the institution is not sufficient for the month.

(06) The diagram shows a straight road PQ runs from South to North. The bus stand is situated at P. The school is located at B at a distance of 100m from P on a bearing of 040^0 and the hospital is located at C at a distance of 150m from P on a bearing of 130^0.

N

Q

P

(i) Represent the above information in a sketch.

(ii) Find the magnitude of $B\hat{P}C$.

(iii) Using the trigonometric ratios,

    (a) Find the shortest distance from the school at B to the straight road PQ.

    (b) Find the value of $P\hat{C}B$.

PART - B

(07) (a) In an arithmetic progression the first term is 15 and the 10th term is 105.

    (i) Find the common difference of this progression.

    (ii) Denote the sum of the first n terms of this arithmetic progression in terms of n.

    (iii) Find the number of terms that should be added from the first term to get a sum of 400.

(b) Find the 7th term of the geometric progression 3, 6, 12, ...

(08) 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 angle $B\hat{A}P$, such that AB = 7cm and $B\hat{A}P = 45^0$.

(ii) Construct the perpendicular bisector of AB and name the point it meets AP or produced AP as D.

(iii) Construct the circle with centre O which passes through the points A, B and D. Give reasons why CD is a tangent to the circle.

(iv) Produce the side CD to E such that DE = 5cm and construct another tangent to the circle from the point E.

(09) (a) A cuboidal shaped glass container has a square base of side length 20cm. This container has been filled with water up to a height of 10cm.

10cm

20cm
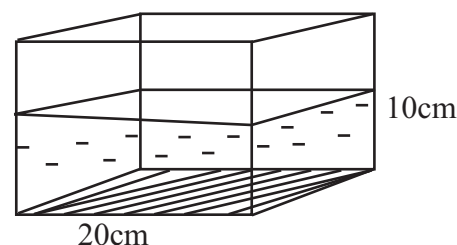
    (i) Find the volume of water in the container in cubic centimeters.

    (ii) 30 solid spheres with radius "a" cm are immersed completely in the water of the container. If the water level goes up by h, show that $h = \dfrac{a^3}{10}$.

(b) When = 3.14 and a = 2.05cm, find the value of h using logarithmic tables to the nearest first decimal place.

(10) AC is a tangent drawn to the circle at B with centre O and the diameter BD. $\hat{CBE} = 60^0$.
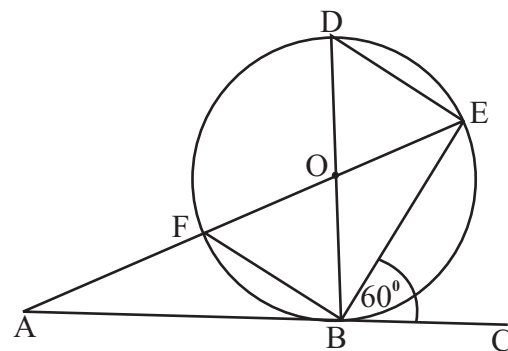
   (i) By giving reasons find the magnitude of following angles.

      (a) $E\hat{F}B$

      (b) $A\hat{B}F$

   (ii) Prove that ABF and ABE are equiangular triangles.

   (iii) If AE = 9cm and AF = 4cm, find the length of AB.

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(11) In the triangle ABC, AB = BC and XY is a line which is drawn parallel to AB through X. The line BA is produced to W such that XC = AW. The lines WX and AC are intersected at Z.
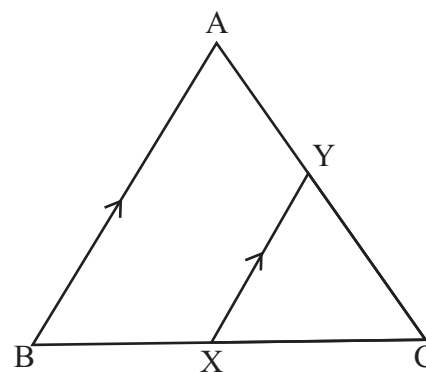
   (i) Copy the figure and mark the given information. Show that the triangle XYC is an isosceles triangle.

   (ii) Prove that, $AZ = \dfrac{1}{4} AC$

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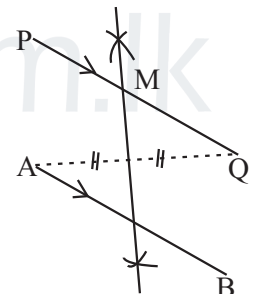
(12) In a sports club of 60 members, 41 are women. Out of them 17 women play athletic events and 14 men do not play athletic events.
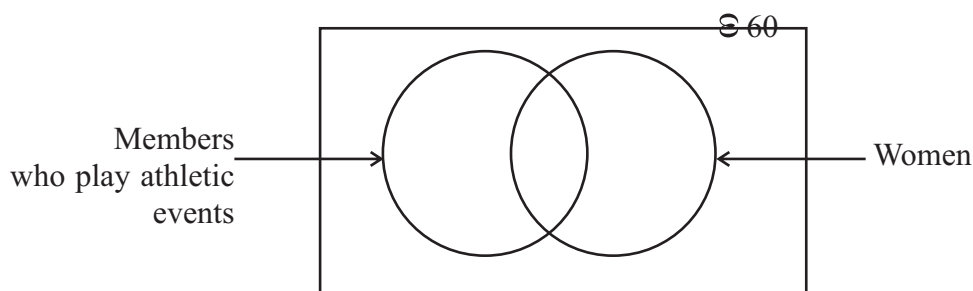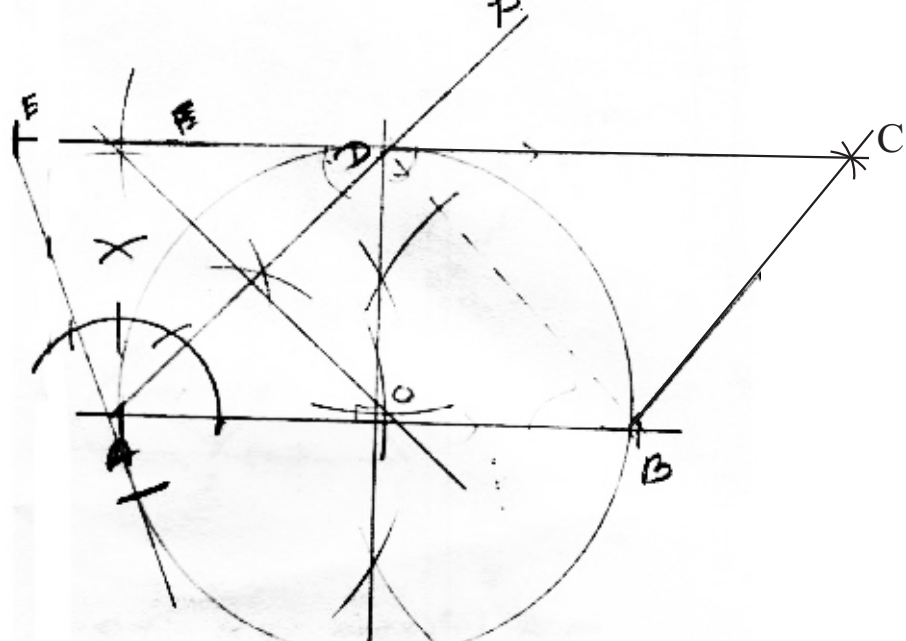
   (i) Copy the venn diagram and represent the above information in it.

   (ii) Shade the region which represent women who do not play athletic events.

   (iii) In this sports club any one who plays team games, does not play athletic events. Out of the 19 members who play team games, 9 are women. Draw a new venn diagram by including data to depict this change and find the number of members who do not participate for any sport.

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වයඹ පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව
Department of Provincial Education - NWP
තෙවන වාර පරීක්ෂණය – 10 –11 ශ්‍රේණි – 2019
Third Term Test - Grade 10 -11 - 2019

ගණිතය **II**

විෂයය Subject		විභාග අංකය Index No.	

විභාග ශාලාවෙන් පිටතට ගෙනයාම තහනම්.   Not to be removed from the Examination Hall.

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ගණිතය **II**

Grade 11 **THIRD TERM TEST - 2019** Mathematics
ANSWER PAPER

PAPER - I / PART - A

01.	$= \dfrac{13800}{46000} \times 100$ $= 30\%$		02
02.	$\dfrac{5 - 3(1-b)}{3b}$ $\dfrac{2 + 3b}{3b}$	01 01	02
03.	$2 \times \dfrac{22}{7} \times r \times \dfrac{1}{4} = 22$ $r = 14cm$	01 01	02
04.	SPR SRQ (S.A.S.)		02
05.	$40\ kmh^{-1}$ $\dfrac{20}{30} \times 60$	01	02
06.	$24\ m^2n$		02
07.	$10^{1.7505} = 56.3$		02
08.	$E\hat{C}D = 145^0$ or $E\hat{B}C = 120^0 / B\hat{C}E = 40^0$	01	02
09.	No of man days = 9 or Man days 36 or 72	01	02
10.	$a = 3$ $b = -2$		02
11.	20		02
12.	65^0		02
13.	$x = 0$ or $x = 1$		02
14.	$A\hat{B}O = 30^0$ or Identifying $A\hat{O}B = 120^0$	01	02
15.	$+1$ $m = \dfrac{7 - 1}{3 - 0}$ $= \dfrac{6}{3}$ $= 2$	01 01	02
16.	$\sin$ or $\cos A\hat{B}C$ or $\cos (90 -)$ Identifying BC = 5cm	01	02

17.	$(A\ B)^I = \{1, 6\}$		02
18.	(i) $xy // AB$ or $xy = \dfrac{1}{2}\ AB$ (ii) $A\hat{C}B = 55^0$	01 01	02
19.	$x = 5$ $y = 4$		02
20.	(i) ✘ (ii) ✔ (iii) ✘		02
21.	Area $= \dfrac{2100}{200}$ $= 10.5cm^2$	01	02
22.	$P(A\ B) = \dfrac{1}{4} + \dfrac{1}{3}$ $= \dfrac{3 + 4}{12}$ $= \dfrac{7}{12}$		02
23.	$x = 60^0$ $y = 120^0$	01 01	02
24.	AQ perpendicular bisector Marking M	01 01	02
25.	11 or Identifying $Q_3 = 21$	01	02 **50**

PAPER - I / PART - B

01.	(i) $\dfrac{11}{15} - \dfrac{1}{3}$ $\dfrac{11 - 5}{15}$ $\dfrac{6}{15}$ $\dfrac{2}{5}$	01 01 01	03

(01)

(ii) $1 - \dfrac{11}{15}$	01		
$\dfrac{4}{15} \times \dfrac{3}{4}$ (Taking $\dfrac{3}{15}$)	01		
$\dfrac{1}{5}$	01	03	
(iii) $\dfrac{1}{5}$ $\dfrac{1}{15}$	01		
$\dfrac{1}{5} \times \dfrac{15}{1}$			
$= 3$	01	02	
(iv) $\dfrac{1}{15}$ 180 000	01		
180 000 x 15			
Rs. 2 700 000	01	02	
		10	

02.	(i) Right angular isosceles	01	01	
	Triangular shape			
	(ii) $= 2 \times \dfrac{22}{7} \times 7 \times \dfrac{1}{2}$	01		
	$= 22$cm	01	02	
	(iii) Area of the shape			
	$= \dfrac{22}{7} \times 7 \times 7 \times \dfrac{1}{2}$	01		
	$= 77$cm²	01		
	Shape B $= 14 \times 14$	01		
	$= 196$cm²	01		
	$= 77 : 196$	01		
	$= 11 : 28$		04	
	(iv) $\dfrac{1}{2} \times 14 \times h = 49$	01		
	$h = 7$cm	01		
	$l = 7 + 14 + 7$			
	$= 28$cm	01	03	
			10	

03.	(a) (i) Amount invested			
	$= 12000 \times 8$	01		
	$=$ Rs. 96 000	01	02	
	(ii) Possession			
	$= \dfrac{12000}{600\,000} \times 100\%$	01		
	$= 2\%$	01	02	

	(iii) dividend income $= \dfrac{30\,000}{12\,000}$	01		
	$=$ Rs. 2.50	01	02	
	(b) Commission $= \dfrac{3}{100} \times 800\,000$	01		
	$=$ Rs. 24 000	01	02	
	Amount received to the owner			
	$= 800\,000 - 24\,000$	01		
	$=$ Rs. 776 000	01	02	
			10	

04.	(a) (i)			

2nd time (for $\frac{1}{5}$)
1st time — win $\frac{4}{5}$ — $\frac{1}{3}$ win / $\frac{2}{3}$ lose ; lose $\frac{1}{5}$ — $\frac{4}{5}$ win / $\frac{1}{5}$ lose

	(ii) $\left(\dfrac{4}{5} \times \dfrac{1}{3}\right) + \left(\dfrac{1}{5} \times \dfrac{4}{5}\right)$	01		
	$\dfrac{4}{15} + \dfrac{4}{25}$			
	$\dfrac{20 + 12}{75}$			
	$\dfrac{37}{75}$	01	06	
	(b) (i)			

Kasun (vertical: P₃, P₂, P₁) — Chamod (horizontal: P₁, P₂, P₃, P₄) — A — Encircling

	(ii) $P(A') = \dfrac{3}{12}$	01		
	$= \dfrac{1}{4}$	01	04	
			10	

05.	(i) $2y = 60^0$	01		
	$x = 120^0$	01		
	Representing in the pie chart	01	03	

(02)

(iii)

0 - 20	20 - 30	30 - 40	40 - 50	50 - 60
08	16	12	08	04

02

(iv)

(v)
- Marking axes   01
- Column 0 - 20   01
- Other columns   01

(ii) Correct frequency polygon
First & last points   01
Other points   01   **05**
10

PAPER - II / PART - A

01. (a) (i) 3   01
     (ii) Correct axes   01
     Marking 5 points correctly   01
     Smooth curve   01   04

(b) (i) $x = -1$ 01
   (ii) $0.2 < x < 1.6$ 01
   (iii) $x = -2.7 \quad x = 0.7$ 02
   (iv) $\sqrt{3} = x + 1$

$$= -1.7 \quad +1.7 \qquad 01$$

$$y = 1 - (x + 1)^2 \qquad 01$$
   06
   10

02. (a) Loan = 80 000 - 8000

$$= Rs. \ 72 \ 000 \qquad 01$$

Monthly instalment without
interest $= \dfrac{72000}{24}$

$$= Rs. \ 3000 \qquad 01$$

Interest for a month unit

$$= 3000 \times \dfrac{24}{100} \times \dfrac{1}{12} \qquad 01$$

$$= 60 \qquad 01$$

No of month units

$$= \dfrac{24}{2} \times (24 + 1) \qquad 01$$

$$= 300$$

Total interest = 300 x 60

$$= Rs. \ 18 \ 000 \qquad 01 \quad 06$$

(b) Interest for the first year

$$= \dfrac{13}{100} \times 72 \ 000$$

$$= 9360 \qquad 01$$

Principle for the second

year = 72000
       9360
     ‾‾‾‾‾‾
     81360

Interest for the second year

$$= \dfrac{13}{100} \times 81360$$

$$= 10576.80 \qquad 01$$

Total interest = 10576.80
       9360.00
    ‾‾‾‾‾‾‾‾
    19936.80   01

19936.80 > 18000

Reducing balance method is
more profitable.   01   **04**
   10

03. (i) $\begin{bmatrix} 3 & 4 \\ 4 & 2 \end{bmatrix}$ 01

$\begin{bmatrix} x \\ y \end{bmatrix}$ 01   02

(ii) $\begin{bmatrix} 3 & 4 \\ 4 & 2 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix}$ 01

$3x + 4y = 220$ ——①   01

$4x + 2y = 210$ ——②   01   03

(iii) ② x 2

$$8x + 4y = 420 \ ——③ \qquad 01$$

③ - ①

$$5x = 200$$

$$x = 40 \qquad 01$$

By substituting $x = 40$ for ①

$3x + 4y = 220$

$3 \times 40 + 4y = 220$

$$4y = 220 - 120$$

$$4y = 100$$

$$y = 25 \qquad 01$$

Price of a yought Rs. 40
Price of an ice-cream Rs. 25   01   04

(iv) $= \dfrac{260}{(40 + 25)}$

$$= 4$$

4 youghts for 4 ice-creams   01   **01**
   10

Grade 11 **THIRD TERM TEST - 2019** **Mathematics**
ANSWER PAPER

PAPER - II / PART - B

04.	(i)	$24 = \dfrac{1}{2}\ (x + 2) \times 2\ (x + 2)$	01	
		$24 = x^2 + 4x + 4$	01	02
		$0 = x^2 + 4x + 4 - 24$		
		$0 = x^2 + 4x - 20$		
	(ii)	$x^2 + 4x - 20 = 0$		
		$x^2 + 4x = 20$	01	
		$x^2 + 4x + 4 = 20 + 4$	01	
		$(x + 2)^2 = 24$	01	
		$x + 2 = \pm\sqrt{24}$	01	
		$x + 2 = \pm 2\sqrt{6}$	01	
		$x = 2\sqrt{6} - 2$ or $x = -2\sqrt{6} - 2$	01	
		x can't be a negative value,		
		$x = 2\sqrt{6} - 2$	01	
		$BC = x + 2$		
		$= 2\sqrt{6} - 2 + 2$		
		$= 2\sqrt{6}$	01	08
				10

| 05. | (i) | 14 - 18 | 01 | 01 |

(ii)

class interval	Mid values	f	fx
2 - 6	4	2	8
6 -10	8	4	32
10-14	12	5	60
14-18	16	7	112
18-22	20	3	60
22-26	22	2	44
26-30	28	2	56
		$f = 25$	$fx = 372$

	Mid value column		01	
	fx column		02	
	fx		01	04
	Mean $= \dfrac{fx}{f}$			
	$\quad = \dfrac{372}{25}$		01	
	$\quad = 14.8$		01	
	$\quad = 15\text{km}$		01	03
(iii)	Monthly expenditure $= 15 \times 25 \times 24$			
	$\qquad\qquad\qquad = 9000$		01	
	$8500 < 9000$		01	02
	Not enough			**10**

06. (i)

			02	
(ii)	$B\hat{P}C = 130^0 - 40^0$		01	03
	$\quad = 90^0$			
(iii)	(a) Representing the shortest distance in the figure		01	
	$\quad \sin 40^0 = \dfrac{BQ}{100}$		01	
	$\quad 0.6428 = \dfrac{BQ}{100}$		01	
	$\quad 64.28\text{m} = BQ$		01	04
	(b) $\tan P\hat{C}B = \dfrac{100}{150}$		01	
	$\quad \tan P\hat{C}B = 0.667$		01	
	$\quad P\hat{C}B = \tan^{-1} 0.6667$			
	$\quad P\hat{C}B = 33\ 42^1$		01	03
				10

07.	(a)	(i) $T_n = a + (n - 1)\,d$		
		$105 = 15 + (10 - 1)\,d$	01	
		$90 = 9d$		
		$10 = d$	01	02
		(ii) $S_n = \dfrac{n}{2}\{2a + (n-1)d\}$		
		$S_n = \dfrac{n}{2}\{2 \times 15 + (n-1)10\}$	01	
		$S_n = \dfrac{n}{2}(20 + 10n)$		
		$S_n = 10n + 5n^2$	01	02
		(iii) $400 = 10n + 5n^2$	01	
		$0 = 5n^2 + 10n - 400$		
		$0 = n^2 + 2n - 80$		
		$0 = (n + 10)(n - 8)$	01	
		$n + 10 = 0$ or $n - 8 = c$		
		$\quad n = -10 \qquad n = 8$		
		Number of sides con't be a negative value,		
		No. of sides $= 8$	01	03
	(b)	$T_n = ar^{n-1}$		
		$\quad = 3 \times 2^{(7-1)}$	01	
		$\quad = 3 \times 2^6$		
		$\quad = 3 \times 64$	01	
		$\quad = 192$	01	03
				10

(04)

08. (i)

(i)	AB	01
	BÂP	01
(ii)	Perpendicular bisector	02
	Parallelogram	01
(iii)	Naming the centre as O	01
	Constructing the circle	01
	OD̂C = 90	01
(iv)	Drawing ED	01
	Constructing the tangent	01
		10

09. (a) (i) Volume = 20 x 20 x 10

$$= 4000 cm^3 \quad\text{——— 01}$$

(ii) $30 \times \dfrac{4}{3} \quad a^3 = 400h$ ——— 02 │ 03

$$\dfrac{a^3}{10} = h$$

(b) $h = \dfrac{3.14 \times (2.05)^3}{10}$ ——— 01

$h = (lg\,3.14 + 3lg\,2.05) - lg10$ ——— 01

$= (0.4969 + 3 \times 0.3117) - 1.000$ ——— 02

$= 0.4969 + 0.9351 - 1.0000$ ——— 01

$= 1.4320 - 1.0000$

$= 0.4320$ ——— 01

$= $ antilog 0.4320

$= 2.704$

$= 2.7cm$ ——— 01 │ 07 / **10**

10. (i) (a) $E\hat{F}B = 60^0$ (Angles in the alternate segment) — 02

    (b) $A\hat{B}F = 180^0 - (90^0 + 60^0)$ (Angles in the semi circle)

        $= 30^0$ — 02   04

(ii) ABF   and ABE

    $A\hat{B}F = B\hat{E}A$ (Angles in the alternate segment)

    $B\hat{A}F = B\hat{A}F$ (common)

    $A\hat{F}B = A\hat{B}E$ (Interior $\measuredangle$ of a)

    ABF   and ABE   are Equi - angular triangles — 03   03

(iii) $\dfrac{AB}{AE} = \dfrac{AF}{AB}$

    $\dfrac{AB}{9} = \dfrac{4}{AB}$ — 01

    $AB^2 = 36$ — 01

    $AB = \sqrt{36}$

    $AB = 6cm$ — 01   03

                         10

11. (i)

To correct figure   02

To prove that :-

    XYC is an isosceles

Proof :-

$B\hat{A}C = X\hat{C}Y$ (AB = BC)   01

$B\hat{A}C = X\hat{Y}C$ (AB // XY)   01

    $X\hat{C}Y = X\hat{Y}C$

    $XY = XC$ 01   05

Therefore $X\hat{C}Y$ is an isosceles

(ii) To prove that :- $AZ = \dfrac{1}{4} AC$

Proof :- XC = XY (Above proof)

       XC = AW (data)   01

        XY = AW

AWZ   and XYZ

    AW = XY (above proof)

    $W\hat{A}Z = X\hat{Y}Z$ (Alternate $\measuredangle$)

    $A\hat{Z}W = X\hat{Z}Y$ (Opposite $\measuredangle$)

    AWZ   = XYZ   (A.A.S.)   02

    AZ = YZ (Corresponding

features of congruent triangles)

    2AZ = AY

    $AZ = \dfrac{1}{2} AY$ ——① 01

    AY = YC (converse of the

                mid-point theorem)

    2AY = AC

    $AY = \dfrac{1}{2} AC$ ——② 01

bu substotituting for ①

    $Az = \dfrac{1}{2} \times \dfrac{1}{2} AC$

    $Az = \dfrac{1}{4} AC$ 05

                         10

12. (i)

Marking 5. 17, 14, 24   04

(ii) Shading the correct area.   01   05

(iii)

Ven diagrame   01
Marking 15, 9, 10   03
4   01   05
                            10