Provincial Department of Education
Northern Province
Second Term Examination-2021
Mathematics

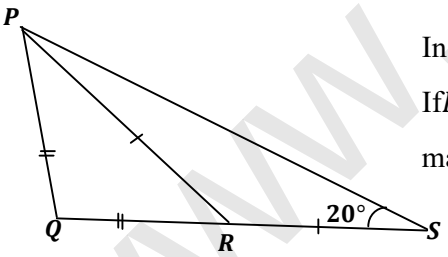
Grade - 11 | **32 T I** | **Time:- 2.00 hours**

Part - I A

Answer all questions

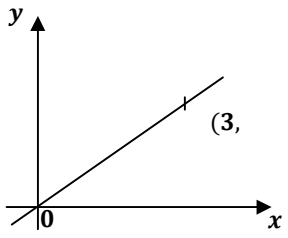
01) When a motorcycle is imported, 30% of its value has to be paid as customs duty. Find the total amount with the duty included, when the motorcycle worth Rs160,000 was imported.

02) Simplify : $\frac{2}{a} - \frac{1}{a+1}$

03) 

In the given figure, QRS is a straight line.

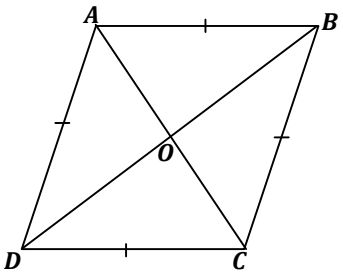
If $PR = RS,\ PQ = QR$ and $P\hat{S}R = 20°$ find the magnitude of $P\hat{Q}R$.

04) 

Find the equation of the straight line passing through the points $(3,\ 6)$

www.lkedu.lk

05) Write all positive integers that satisfies the inequality $2x + 3 < 10$.

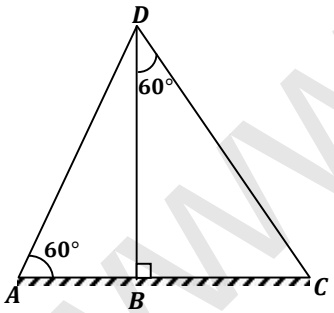
06) 

The area of a rhombus is $72\ cm^2$. If one of the diagonal (BD) is $18\ cm$ long, find the length of other diagonal AC.

07) A container contains $10\ell s$ of milk. This milk is filled in $750\ m\ell$ bottles.

(i) Find the maximum number of bottles that can be filled.

(ii) Find the amount of milk in $m\ell s$ is left then?

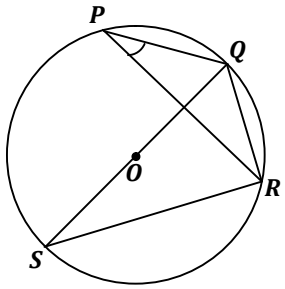
08) 

(i) Find the angle of elevation of D, When observed from the point A.

(ii) Find the angle of depression of, when observed from the point.

09) Find the least common multiple of the algebraic terms $3x^2y,\ 12\ xy^2$ and $18\ x$.

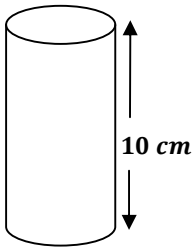
www.lkedu.lk

10) 

In the given figure, O is the centre of the circle. If $Q\hat{P}R = 30°$ find the magnitude of $S\hat{Q}R$.

11) Solve : $3x^2 - 27 = 0$

12) If $P(A) = \frac{1}{4}$, $P(B) = \frac{2}{3}$ and $A \& B$ are two independent events, find $P(A \cap B)$?

13) 

The base circumference of a right circular cylinder is $44\ cm$ and its height is $10\ cm$. Find the area of its curved surface.

14) It took 1.5 hours to completely fill a water took using a water hose at a rate of 30ℓ / Minuts. Find the capacity of the tank.

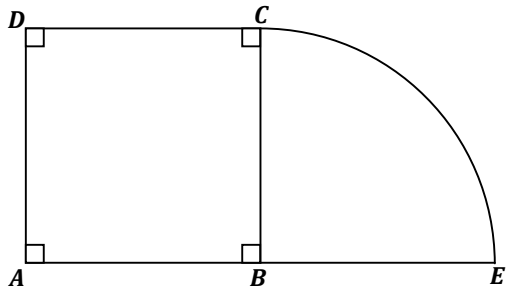
15)

Class interval	Mid value (x)	Deviation (d)
$21 - 25$	23	
$26 - 30$	28	
$31 - 35$	33	
$36 - 40$	38	

Complete the deviation column of the table with the mid value of the class interval $31 - 35$ as assumed mean.

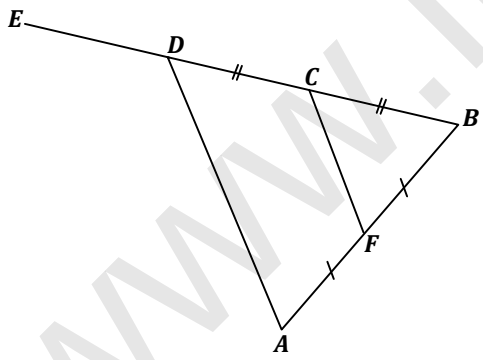
www.lkedu.lk

16) Write $\lg 4.56 = 0.689$ in index form?

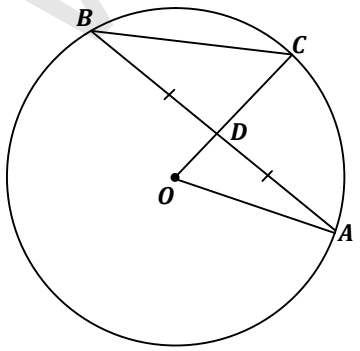
17) 

The compound plane figure is made up of square $ABCD$ and quarter circle BCE. If $AB = 15\,cm$, find the perimeter of the compound figure.

18) First term of an arithmetic progression is 5 and its 3rd term is 9. Find the 10th term.

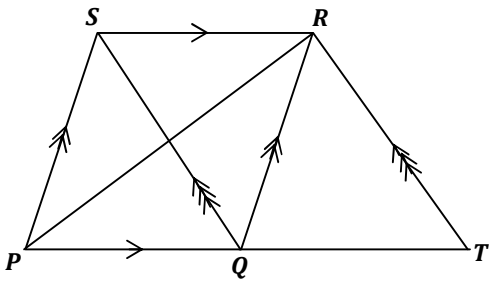
19) 

In the triangle ABD, BD is produced to E. F and C are the midpoints of AB and CD respectively. If $A\hat{D}E = 140°$, Find the magnitude of $B\hat{C}F$.

20) 

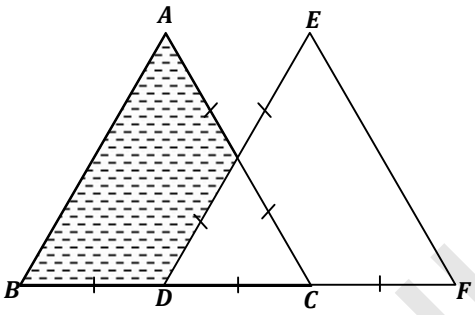
In the given figure, O is the centre of the circle. If $A\hat{O}C = 60°$ and $AD = BD$ find the magnitude of $O\hat{C}B$.

www.lkedu.lk

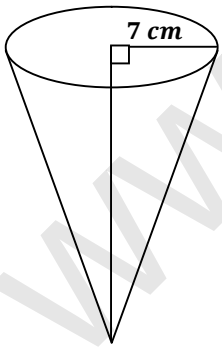
21) 

In the given figure, PQT is a straight line. If the area of triangle PRTis12 cm^2, find the area of the parallelogram $PQRS$.

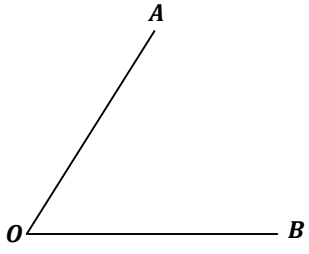
22) Make $'b'$ the subject of the formula $ab = \sqrt{b^2 + a}$.

23) 

In the given figure, $\Delta\, ABC$ and $\Delta\, DEF$ are similar equilateral triangles. What fraction of the total area is the area of the shaded area?

24) 

If the capacity of a right circular cone with a radius 7 cmis616 $m\ell$, find the height of the cone.

25) 

Denote the point as C which is equidistance from the straight lines OA and OB and at equidistance from points $O$and B.

www.ikegu.lk

Part - II B

Answer all questions.

01) In a test conducted to measure the efficiency of employees working in a company, $\frac{2}{5}$ employees scored less than 40 marks 20% of them scored over 75 marks. The number of remaining staff is 60.

(i) Give the number of employees who get more than 75 marks as a fraction of the total number of employees.

(ii) Give the number of employees who scored 40 marks and above as a fraction of the total number of employees.

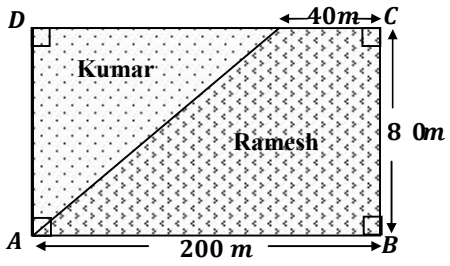
(iii) Give the number of employees who scored 40 marks and above as a fraction of the total number of employees.

(iv) Find the number of employees working in the company.

(v) $\frac{1}{15}$ of the employees received high scores. It was decided by the company to provide an incentive of Rs10000 for each of them and Rs. 3000 for special traing for each employee who scored less than 40 marks. Find the money needed for this.

www.lkedu.lk

02)



(i) Name the geometric plane figures of land owned by Kumar and Ramesh respectively.

(ii) What is the area of Ramesh plot of land?

(iii) What is the ratio between the plot of lands owned by Kumar and Ramesh.

(iv) Kumar wants to change his land into square shape without changing its area. Find the length of one side of the square land and draw itWITH MEASUREMENTS.

(v) Kumar decides to plant pillars at $5\,m$ distance around his land. Find the number of pillars required.

03)

Senior citizens be offered a simple interest of15% per annum of fixed deposits

An annocement was made by a bank as above.

(i) Mr. Mohamed puts Rs. 500000 in a fixed deposit in the bank. Find the total money he will receive at the end of two years.

www.lkedu.lk

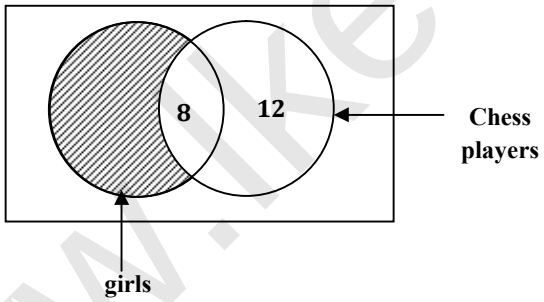
(ii) If he invests the total amount of money received from the bank to buy some shares at Rs50 in a company.

(iii) The company pays annual dividends of Rs8per share. Find the annual dividends income he received?

(iv) At the end of two years, he sold all the shares at Rs60 per share. Find his capital gain?

(v) Express his capital gain as a percentage of the amount invested.

04) (a) The Venn diagram shows the details of the 40 students who are studying in Gr 11 who can play chess.



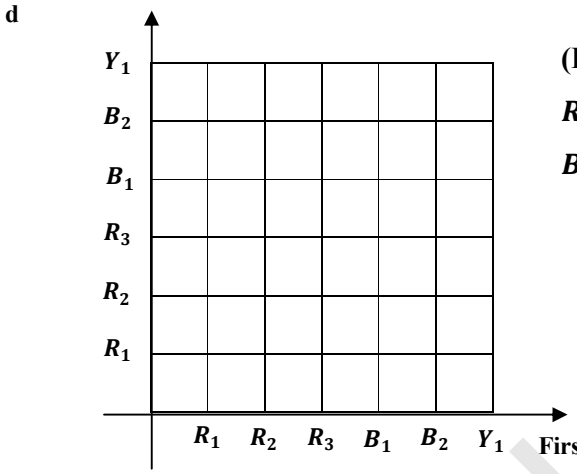
(i) Describe the shaded part in words.

(ii) The number of girls in the class is 18. Find the number of boys who cannot play boys.

www.ikedu.lk

(b) A bag contains 3 red balls, 2 blue balls and one yellow ball of the same size. A ball is taken out of the bag and marked with its colour, and another ball is picked up and marked with replacement.

(i) Show the relevant sample in the girls.



(Redmarbles :R_1 , R_2, R_3Blue marbles :B_1 , B_2Yellow marbles :Y_1)

(ii) Find the probability of both marbles being the same colour and indicate the event on the grid.

(iii) Find the probability of the first marble being yellow and the second marble being or blue?

05) The following stem leaf diagram shows the number of patients who visited a particular Divisional hospital in 30 days for treatment.

Stem	Leaf
0	9
1	8 9
2	3 3 5 6 6 7 7 8 9 9 8
3	4 6 7 7 7 7 8 8 8 8 8 8 9 9 9
4	0

www.lkedu.lk

(i) Find the range and median of this group of data.

(ii) Complete the following table using the above stem and leaf diagram.

(Here the class interval$8-14$represents$8<x\leq 14$)

Class interval (Number of patients)	Frequency (Number of days)
$8-14$	1
$14-20$	
$20-26$	
$26-32$	6
$32-44$	

(iii) Find the angle of sector of the class intervals to show the above information in a pie chart.



(iv) Represent the above information in a pie chart (Circular graph)

www.lkedu.lk

Provincial Department of Education
Northern Province
Placement Examination-2021
Mathematics

Grade - 11 | **32 T II** | **Time:- 3.10 hours**

- **Answer the questions selecting five questions from part (A) and five questions from part (B)**
- **The volume of a solid right circular cylinder of radius r and height h is $\pi r^2 h$.**
- **The volume of a solid sphere of radius r is $\frac{4}{3}\pi r^3$.**

Part - II A

01)

A fridge priced at Rs. 130 0 0 for outright purchase can be bought by making a down payment of Rs 30 0 0 and paying the rest in 20 equal monthly installments.
If a 24% annual interest rate is charged on the loan, where the interest is calculated on the reducing loan balance.

(i) Find the remainingloan amount.

(ii) Find the loan amount for a month.

(iii) Find the monthly interest charged on loan amount for a month.

(iv) What is the number of month units?

(v) Find the total interest.

(vi) Find the amount of a monthly installment.

02) An incomplete table of the quadratic function $y = (x + 1)(x + 3)$is given below.

x	-5	-4	-3	-2	-1	0	1
y	8	3	0	.....	0	3	8

www.ikeau.lk

(i) Find the value of y when $x = -2$.

(ii) Using the standard system of axes, draw the graph of the given quadratic function.

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

(iv) Write down the coordinates of the turning point.

(v) Write down the range of values of x for which the function increasing positively.

(vi) Write down the equation of the graph in the form $y = (x + a)(x - b)$, which is obtained when the above graph is shifted along positive direction of x axis.

03) The table containing information on the masses (in kg) of grade 13 students given below.

Mass kg	Number of students
$40 - 50$	4
$50 - 60$	4
$60 - 70$	5
$70 - 80$	7
$80 - 90$	6
$90 - 100$	5
$100 - 110$	4

(i) Which mass interval does the most number of students fall into?

(ii) Taking the mid value of the class interval $70 - 80$ as the assumed mean, or otherwiae, find the mean mass to nearest whole number.

(iii) Show that possible maximum total mass of 35 students is more than $2700\ kg$.

04) In covid 19 infected, total number of people who were affected by type 'A' and type 'B' are 100. In same tablets for two types, A patient in type "A" need $50g$ and A patient in type "B" need $100g$. Total mass of tablets for all the patients is $9g$.

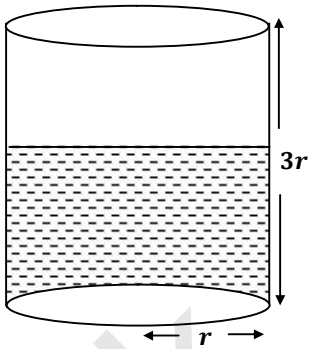
(i) Construct of pair of simultaneous equations by taking the number of people who affected by type "A" as x, the number of people who affected by type "B" as y.

(ii) Solve the pair of simultaneous equations and fine separately, the number of people affected by type "B".

www.lkedu.lk

(iii) If the number of type A infections has increased by 40 and 20 of the type B infections have been cured, show that total mass of $9g$ tablet is still enough.

05) A right circular cylindrical container, of height $3r\ cm$ and radius $r\ cm$, is filled with $420\ m\ell$ water. When two solid spheres of radius $\frac{r}{2}\ cm$is placed in the container, the water of the container reaches the spilling level.



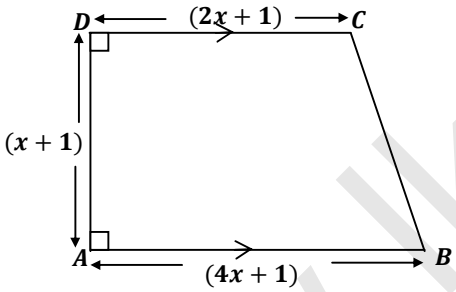
(i) Express $420\ m\ell$in interms ofcm^3?

(ii) Find the capacity of cylinder interms of π and r?

(iii) Show that $r^3 = \frac{162}{\pi}$.

(iv) Make r as the subject and using the logarithms table, find the value of r. ($\pi = 3.14$)

06)



(i) If the area of the trapezium is 9 square units, show that $3x^2 + 4x - 8 = 0$.

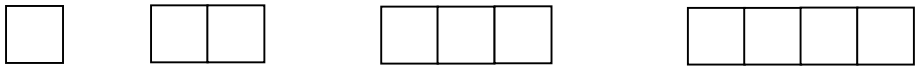
(ii) Using the formula or by any other method, Find the value of x. (Take the value of $\sqrt{7} = 2.6$)

(iii) Round off the value of x in second decimal place and find the lenths of parallel lines of trapezium.

www.ikedu.lk

Part - II B

07) The first four instances of a square pattern constructed by using sticks are shown in the diagram.



(i) Write a pattern of number of sticks used to construct each instances. Write the reason for above pattern is an Arithmetic progression.

(ii) How many sticks are needed to construct 20^{th} instances?

(iii) Show that 95 is not a term of the pattern?

(iv) Show that the total number of stricks needed to construct this pattern up to the n^{th} pattern is $\frac{n}{2}(3n+5)$.

(v) Show that, the total number of stricks needed to construct this pattern up to the 50^{th} pattern is more than 3800.

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

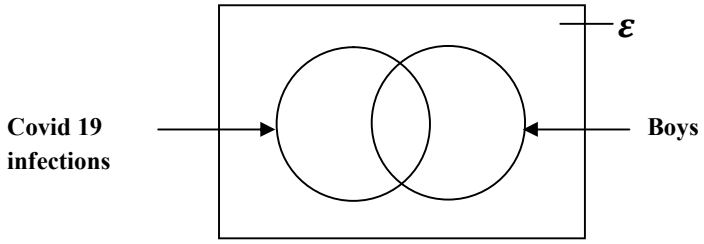
(i) Construct the triangleABC with $AB = 8\,cm,\ A\hat{B}C = 60°$ and $BC = 7\,cm$.

(ii) Construct the quadrilateral with $AB//CD$and$CD = 7\,cm$.

(iii) Write the special name of $\Delta\, BCD$ with reason.

(iv) Construct the locus of a point equidistant from the points C and D, and name the point it intersects the side name the point it intersects the side CD as E. Write the reason for ABE is a right angle triangle.

09) The venn diagram about covid 19 infectious from 100 people who participated in a meeting, is given below.



www.ikedu.lk

(i) ✶ 30 people who are covid 19 infectious

✶ 40 girls who are not covid 19 infections.

Copy the given Venn diagram in your answer script. Include the above information in the Venn diagram.

(ii) Find the number of boys. Who are not covid 19 infections?

(iii) In the Venn diagram, shade the region which represent girls who infected by covid 19

(iv) If 10 boys are infected by covid 19, How many girls covid 19 infections?

(v) After the recent treatment, If 6 boys and 4 girls recovering from covid 19 infections. Redraw the Venn diagram using the present covid 19 situation?

10) (a) If A and B are independent events, Write the relation using $P(A \cap B)$, $P(A)$ and $P(B)$.

(b) When analyzing the result of PCR test, related to covid 19, According to PCR test, probability one who is infectious is $\frac{3}{7}$.

(i) Draw a tree diagram to show the above information.

(ii) If the probability for one who is infectious as male is $\frac{2}{3}$, probability for one who in infectious as female is $\frac{3}{4}$, Extend the above tree diagram and write the relavant probabilities.

(iii) Find the probability for one who is covid 19 infectious as female.

(iv) Find the probability for one who is not covid 19 infectious as male.

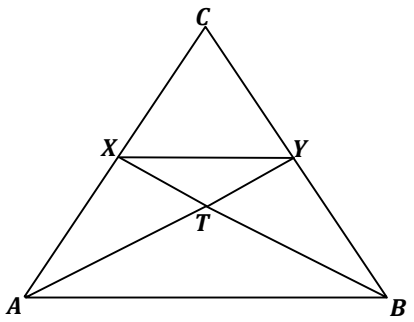
(v) When PCR test was done for 210, How many males were not infectious?

11) In the triangle ABC given in the figure, $AC = BC$. Moreover, X and Y are the midpoints of AC and BC, nespectively. The lines AY and BX intersect at T. Copy the figure in your answer script.

(i) Show that $\Delta\, ABX \equiv \Delta\, ABY$.

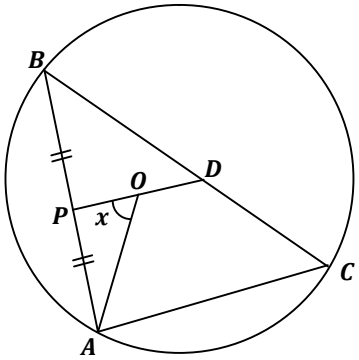
(ii) Show that $B\hat{T}Y = 2\, T\hat{A}B$.

(iii) Show that area of $\Delta\, ABY = 2X$ area of $\Delta\, AXY$



www.ikedu.lk

12) In the figure, AB, BC and AC are chords of the circle with centre O. P is a mid point of the circle. Straight line drawn from P through Q, meets BC at D. If $A\hat{O}P = x$, Find $A\hat{C}D$ interms of x and Show that $A\hat{C}D + A\hat{O}D = 180°$



www.lkedu.lk