දකුණු පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව / தென் மாகாணக் கல்வித் திணைக்களம்
DEPARTMENT OF EDUCATION-SOUTHERN PROVINCE
THIRD TERM TEST - 2021 (MARCH 2022)

| Grade 11 | Mathematics - 1 | Time: 2 hours |

Name/ Index No ....

- **Answer all the questions in this paper it self.**
- **Each correct answer carries 2 marks for part A and 10 marks for each question in part B.**

Part A

1. Select and underline the correct relation when finding $\sqrt{79}$ to the first approximation.

   (i) $9 < \sqrt{79} < 10$ (ii) $8 < \sqrt{79} < 9$

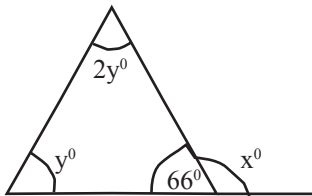   (iii) $7 < \sqrt{79} < 8$ (iv) $6 < \sqrt{79} < 7$

2. The figure shows a semi-circular frame made out of a wire.

   Find the length of the wire when the frame is cut and streched.

   $\leftarrow$ 28cm $\rightarrow$
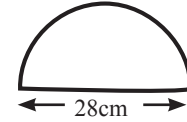
3. Express lg1000=3 in index form

4. A={x : x ∈odd numbers 11 < X < 20} list the elements of set A.

5.

   Find the values of x^0 and y^0 by using the information in the figure.'

6. It is estimated that 5 men take 6 days to complete a certain work.How many days will it take 3 men to complete the half of the work.

7. Find the smallest expression that is divisible by both $6x^2$ and $4xy^2$ without remainder.
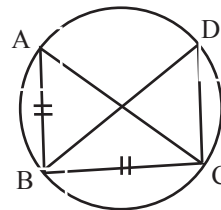
1

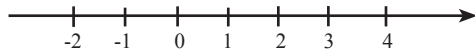8. If $\cos\theta = 3/5$ in the right angled triangle given. Find the ratio of $\tan\theta$
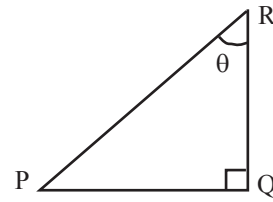
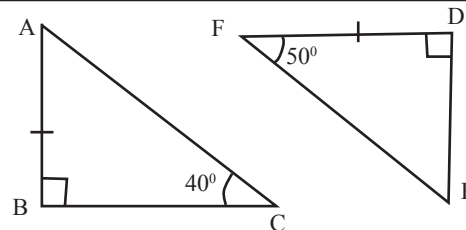9. ABCD is a cyclic quadrilateral. AD is produced to E. Find the value of x and y.
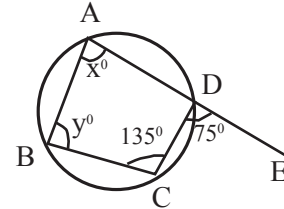
10. AC is a diameter and AB = BC in the figure. Find the value of $B\hat{D}C$.

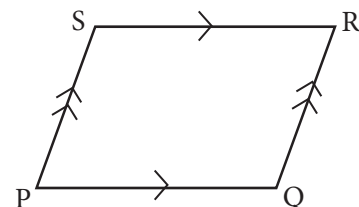11. Solve the inequality $2x + 1 \leq 5$ and represent all the solutions on the number line given.

12. Write the case of congruency of the triangles ABC and DEF.
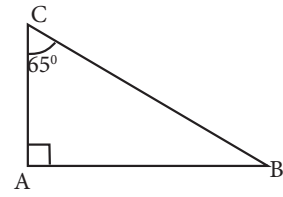
13. PQRS is a parallelogram.

If the following statements are true mark '√' and if it is false mark 'X' infront of it.

|	
Area of PQS Δ = 1/2 × Area of PQRS parallelogram	
The diagonal PR bisects $S\hat{P}Q$	

14. Find and mark an angle of depression of a fish on B seen from a bird on C in the figure given.
    (A,B,C are in the same vertical plane).

C

65^0

A

B

---

15. ED is the tangent drawn to the circle with centre **O** through the point A.Find the magnitude of AÔB.

E

O

C

A 35^0

B

D

---
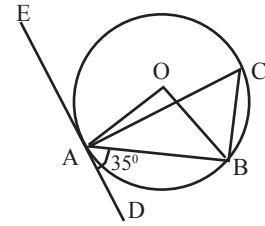
16. The volume of the given prism is 1200cm³·
    Find the length (l) of the prism.

l

6cm

8cm

---
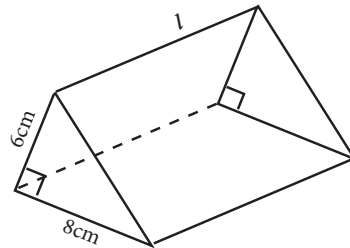
17. Write the equation of the straight line AB of the form y = mx + c by using the data given.

y

B

2

y=3x

A

o

x

---
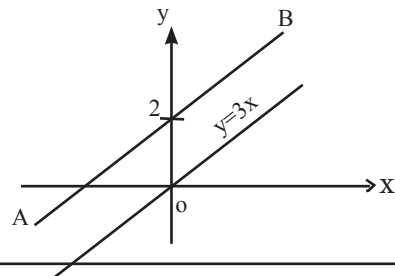
18. In the figure AB = AC, PQ = PC and AB // PQ.If PÔC = 30^0
    Find the value of BCA.
    ^

A

Q

30^0

P

B

C

---
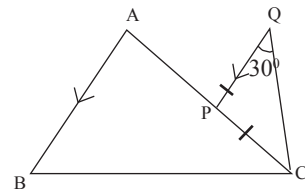
19. The locus of the points which is moving 6 cm constant distance away from the AB straight line is PQ.Mark the point R on PQ which is equidistance from the points A and B.

P

Q

A

B
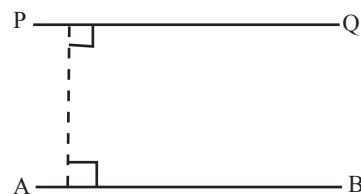
20. Value added tax (VAT) of 14% is added to the monthly water bill of a household.Find the total amount to be paid for a bill of Rs.1800/-.

21. Find the factors $5x^2 - 7x - 6$

22. A bottle contains 100 orange and mint flavoured toffees of same size.When a toffee is taken out randomly from the bottle,the probability of getting an orange flavoured toffee is $\frac{3}{5}$ Find the number of mint flavoured -toffees in the bottle.

23. The data obtained by measuring the heights of 7 students in A/L maths class in a certain school to the nearest centimeter is given below.180, 182, 176, 178, 185, 177, 175 Find the inter-quartile range of the group of data

24. Simplify.

$$\begin{pmatrix} 5 & 0 \\ 1 & -5 \end{pmatrix} \times \begin{pmatrix} 4 \\ 2 \end{pmatrix}$$

25. Solve $\dfrac{1}{5x} + \dfrac{1}{x} = \dfrac{1}{5}$

PART B

Answer all the questions in this paper itself.

1. In a certain country $\frac{1}{16}$ of daily electricity requirement is getting from wind power,and 1/5 of the remaining requirement is from solar power.

    (i) What fraction of the total electricity requirement is getting without wind power?

    (ii) What fraction of the total electricity requirement is getting from solar power?

    (iii) The amount of electricity from wind and solar power taken is 12 GWh (Giga watt hours). If the rest is taken from hydropower and fuel,How many giga watt hours are taken from hydropower and fuel?

    (iv) About 75% of the electricity generated from hydropower and fuels is taken from fuel.It costs US Dollars 120,000 for a 1 G 1ga watt hour to generate electricity from fuel.How many US dollars does it cost per day to generate electricity from fuel?

2. The figur shows plan of play ground consisting of ABGF trapczium and DE F Sector IFAB = AE

    GC = 6m, FD = 2m and GF = 16m

    (i) Find the arc length DE? (2 marks)

    (ii) Find the don't perimeter of the playground. (2 marks)

    (iii) Find the area of the playground. (3 marks)
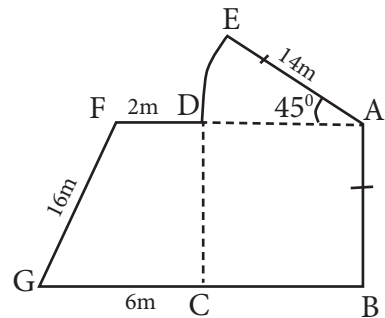
    (iv) if it costs Rs.200 per square metre to cover the playground completely, with grass show that the cost does not exceed Rs.70,000. (3 marks)

3. (a) The assessed annual value of a certain house is Rs.140,000.If the municipal council charges 8% of the house as rates.

  (i) Calculate the rates that have to be paid for a year.

  (ii) Calculate the rates that need to be paid for a quater.

 (b) Sisira invested Rs.70,000 and bought shares in a company at the market price of Rs.35 per share.The company pays annual dividends of Rs.5 per share.

 (i) Find the annual dividends income that sisira receives from this investments.

    After receiving dividends for a year,he sold all his shares at Rs.30 per share.He spent all the money he received by selling these shares and his annual dividends income,to buy shares in a company at the market price of rs.35 per share. From this second investment he gained an annual dividends income of Rs.16,000.

  (ii) Calculate the number of shares he bought from the second company.

  (iii) Find the annual dividends that the second company paid per share.

---

4. The following is an incomplete table and histogram containing data obtained from a premiliary test for imposing speed limits on a road within 4 hours of a day.

Speed (Kmh^{-1})	20-30	30-40	40-60	60-70	70-100	100-110
Number of vehicles	------	----------	42	36	36	30
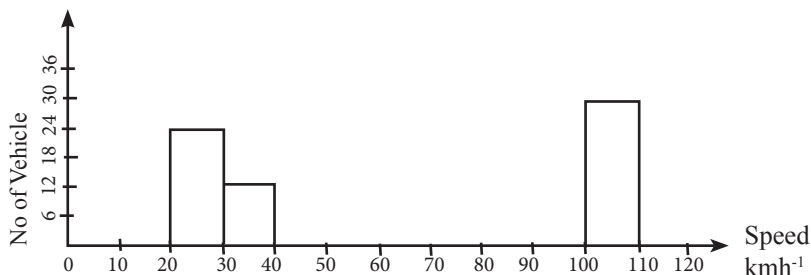
  (i) Complete the table.

  (ii) Complete the histogram.

  (iii) Draw the frequency polygon using histogram.

  (iv) (iv)If the speed is x , its limit is determined as $40 \leq x \leq 90$.How many vehicles are not within the above limit according to this test?

5. Limon and Omindu hope to have their car emission test on any day within the next 5 days from Monday to Friday.

   (i)   Mark the days on which both of them can do their car emission test in the grid using "X" mark.

   (ii) Encircle the event that Omindu perform the car emission test after Limon,and name it as A.Find PC (A)

   (iii) A technician says that Limon's and Omindu's cars have 5/6 and 4/5 probability of passing the car emission test.

       Complete the following tree diagram.
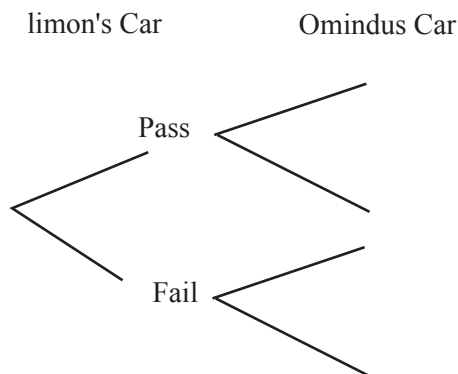
   (iv) Find out the probability that atleast one of their car will fail the emission test.

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DEPARTMENT OF EDUCATION-SOUTHERN PROVINCE

THIRD TERM TEST - 2021 (MARCH 2022)

Grade 11	**Mathematics - 11**	**Time: 3 hours 10 minutes**

Name/ Index No ....

- **Write the relevant steps and units**
- **Each equestion carries 10 wards.**
- **Volume of acglinder with radials r and helght h is $\pi r^2 h$ and the volume of a cone with base radias r and perpendicalat height h is $\frac{1}{3}\pi r^2 h$**


PART - A

1. A computer priced at Rs.100,000can be purchased by making a down payment of 10% of the value and paying the rest in 15 equal monthly installments of Rs.6640.00.If the interest on the loan is calculated on the reducing loan balance, Find the annual interest rate.

2. An incomplete table to draw the graph of the function $y = x^2 - 2x - 3$ is given below.

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

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

   (ii) Using a suitable scale and standard axis draw the graph of the given quadratic function in a graph sheet.

   (iii) Draw the axis of symmetry and write down its equation.

   (iv) Write the range of value of y when $-2 \le x \le 0$

   (v) Write the maximum value of the function $y = 3+2x-x^2$ by using the graph.

3. a) The prices of two short sleeved shirts and a long sleeved shirt is Rs.3000.With the money spent for buy 3 long sleeved shirts you can buy 4 short sleeved shirts.

   (i) By taking the price of a short sleeved shirt as "x" and the price of a long sleeved shirt as "y" build up a pair of simultaneous equation.

      Write the relevant steps and cinits.

      Each question carries

      Volume of a cylinder with radiul r and heigh his $\pi r^2 h$ and the volume of a coue with base radius r and perpendicalar height h s $\frac{1}{3}\pi r^2 h$

   (ii) Solve the pair of simultaneous equation and find the price of a short sleved shirt and the price of a long sleeved shirt.

      (b) Factorize.
         $x^2 + 4x + 4 - y^2$

4. The parallelograms ABCD and ABEF lie on the same base AB as shown in the figure. Further more, AB = x cm , CG = 2x and HF = (x + 2)cm

    The area of ABCD is 11 cm^2 greater than the area of ABEF. Show that x satisfies the quadratic equation $x^2 - 2x - 11 = 0$ and find the height of FH to the first decimal place(($\sqrt{3} = 1.73$))
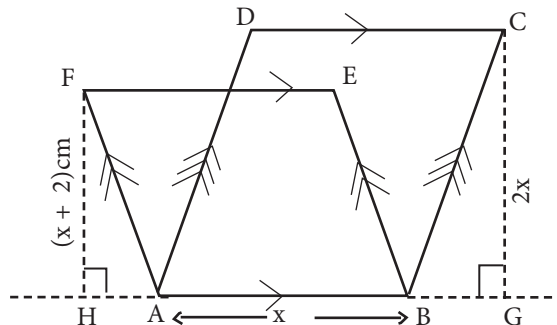
5. Menuka who is on the point A of the river bank trying to find the breadth of a river which has straight banks on the two sides flowing from west to east. B is located on the opposite bank and north of A. When he travels a distance of 35m from A to C that is on west of the bank,he observes that the bearing of B from his location is 040^0.
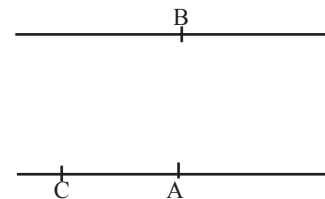
    (i)   Represent these information in a rough sketch.

    (ii) Find the breadth of the river to the nearest metre.

    (iii) If he travels another 10m to the west of the bank from C to D.Find the bearing of B seen from D.

6. The table below shows the number of students who attended 40 online classes of 2 hours conducted for grade 11 students in a particular school.

Number of students	41-45	46-50	51-55	56-60	61-65	66-70	71-75	76-80
Number of class sessions	3	5	7	11	8	3	1	2

    (i)   What is the modal class of the above distribution?
    (ii) Taking the mid value of the modal class as the assumed mean, or otherwise find the mean number of students who attended to the online class to the nearest whole number.
    (iii) show that the number of study hours of students who attended all the online class sessions did not exceed 5000 hours.

Part B

7. (a) A cars starts to travels and travels 5m in the first second and there after in every second it travels 2m more than the previous second.

    (i)   Find the distance travels in the 20th second.

    (ii) Show that the total distance traveled after 20 seconds is not less than 1/2 km.

    (iii) Which term is -640 in the progression 5,-10,20,-40.....

8. Constructs the following by using only a pair of compass and a cm/mm straight edge.Show the construction lines clearly.

    (i)   Construct the triangle $A\hat{B}C$ such that AB = 6 cm , $B\hat{A}C = 60^0$ and AC = 5 cm

    (ii) Construct the angle bisectors of $C\hat{B}D$ and $B\hat{C}E$ by producing AB side to D and AC side to E.Name the intersection point of the bisector as 'O'

    (iii) Construct a prependicular to BD from O and name its base as F.

    (iv) Construct a circle by taking O as the centre and OF as the radius.   `

    (v)   Write the name of the circle by considering ABC triangle.

9.   In the given figure, ML//NP, KL = LM and QM = QN
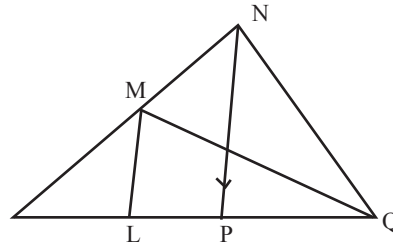
    (i)   By taking $Q\hat{K}N = x^0$ and $K\hat{N}Q = y$, Find the value of KQN using x and y.

   (ii) Prove that $L\hat{Q}M = P\hat{N}Q$

    (iii) Prove that PQ = KL

10. QR is the tangent to the circle through P. S is a point on the circle.Angle bisectors of $Q\hat{P}S$ and $S\hat{P}R$ intersect the circle at the points X and Y respectively. Prove that XY bisects the straight line PS perpendiculary.

11. A cylinderical shaped tin of base radius 14cm and height 20cm is completely filled with water. This volume of water is exactly enough to fill 40 conical shaped containers of base radius r and height 10cm.

Show that the base radius of the conical container is given by $r = \sqrt[2]{\frac{5}{3}}$ cm and using logarithm table find the value of r to the first decimal place.

12. Following information is revealed about 60 passengers in a bus.
   * There are 30 women in the bus.
   * 28 passengers have smart phones,and 13 of them are male.
   * Five women haven't a phone.
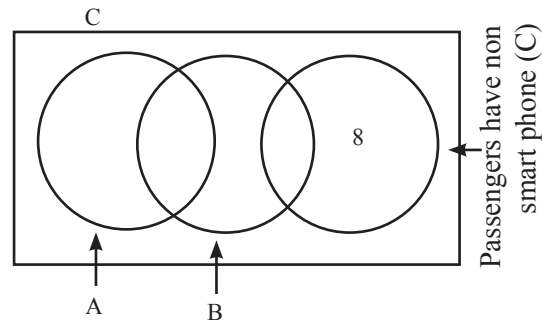
(i) Copy the venn diagram given in your answer sheet and name A and B.
(ii) Include all the above information in the venn diagram.
(iii) Describe the region which there are 8 elements in words.
(iv) Find n $(A \cup B \cup C)$[1]

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