Provincial Department of Education - NWP

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32	E	I

Second Term Test - Grade 11 - 2019

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Name/Index No: ..... **Mathematics - I**

Time: 02 hours

- **Answer all the questions on this paper it self.**
- **2 marks for each questions of part A and 10 marks for each questions of part B.**

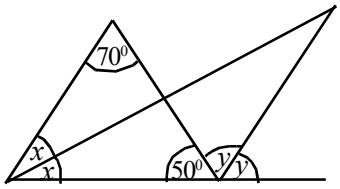
Part A

(1) Find the simple interest that has to be paid for 2 years on a loan of Rs. 85 000 borrowed at an annual simple interest rate of 12%.

(2) Find the first approximation of $\sqrt{19}$

(3) Solve. $x\,(x - 3) = 0$

(4) Find the value of x and y based on the information given in the diagram.

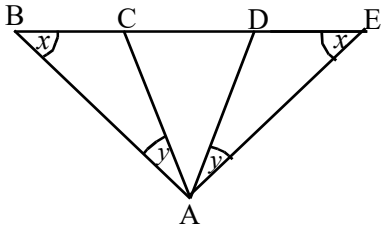


(5) It was necessary to engage 3 men for 5 days at 8 hours per day to complete a certain task. How many extra hours a man should work to complete the same task in 4 days, by the above 3 men.

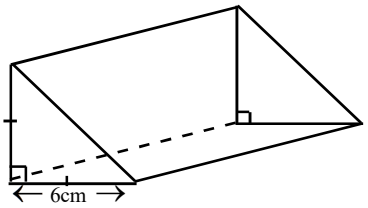
(6) It $\ell g\ x = 3$, find the value of x.

(7) Find the Least Common Multiple of $3ab$, ab^2 and $2a$

(8) Name 2 isosceles triangles based on the information given in the diagram.



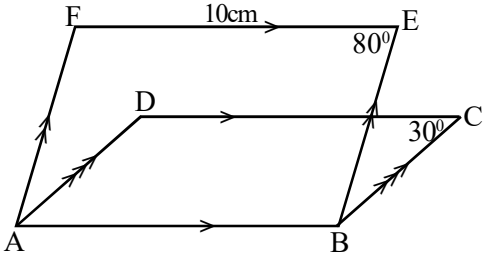
(9) Draw the sketch of 2 different faces with measurements of the given prism.



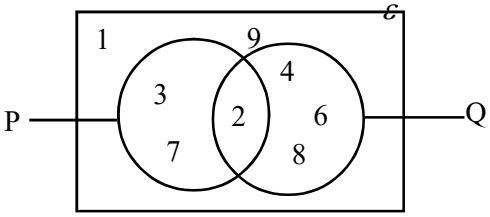
(10) ABCD and ABEF are 2 parallelograms. According to the given data,

(i) Find the length of the side CD.

(ii) Find the magnitude of $\mathrm{D\hat{A}F}$

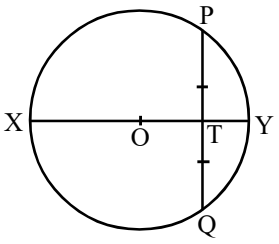


(11) Write down the set $P' \cap Q$



(12) Make ℓ the subject of the formula $K + \sqrt{\frac{\ell}{T}} = P$

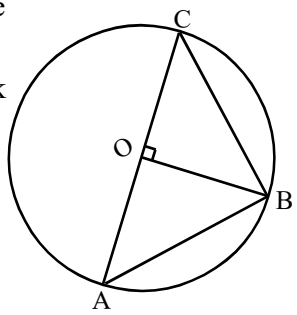
(13) The radius of the circle with centre O is 13cm.
If PT = 12cm, Find the length of TY



(14) What is the probability of obtaining a multiple of 2 or a multiple of 5, when 10 cards with the mumbers 1 to 10 marked on its faces is drawn randomly?

(15) In the circle with centre O, illustrated in the figure, AC is the diametre and the points A, B and C are on the circle.

In the given table, put "✓" mark infront of each correct statement and "✗" mark infront of each incorrect statement.

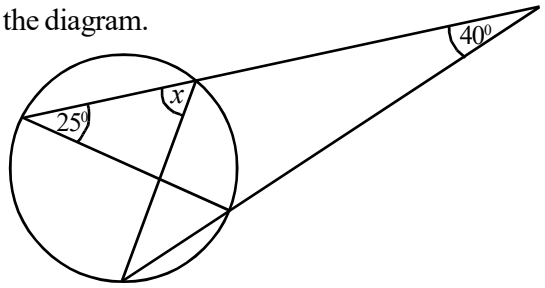


$A\hat{C}B = 2A\hat{O}B$	
$A\hat{B}C = 90^0$	
$A\hat{B}O = O\hat{B}C$	

(16) Simplify. $\frac{x}{2} + \frac{1}{3x}$

(17) Find the time in minutes, taken by a vehicle travelling at a uniform speed of 60 kmh^{-1} to travel a distance of 40km.

(18) Find the value of x, based on the information given in the diagram.



(19) A part of a certain group of data written in ascending order is given below.

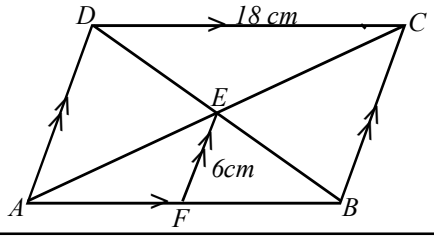
3, 4, 4, 6, 7, 8, 10, 11, 12, ...

It's median and the inter quatile range is 11 and 8 respectively.

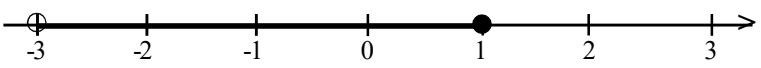
(i) Find the total number of data in the group

(ii) What is the third quatile?

(20) Find the perimeter of the parallelogram ABCD based on the given information



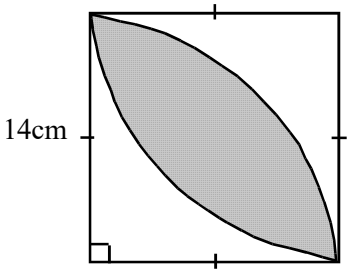
(21)



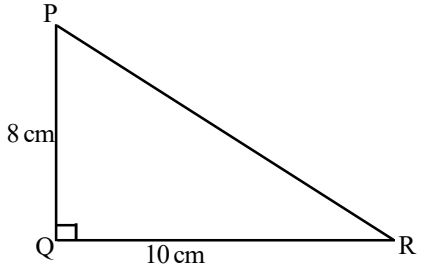
(i) Write down the inequality represented on the given number line.

(ii) How many integer solutions of the inequality are there?

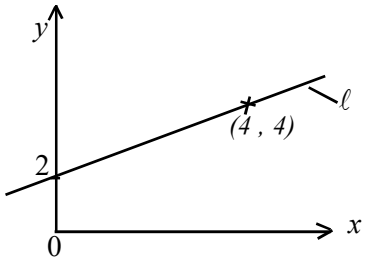
(22) Find the perimeter of the shaded region using the given data.



(23) In the figure, draw a sketch of the construction lines required to find the point "S" that is equidistant from the sides PQ and QR, and 3 cm away from the point Q.



(24) Write the equation of the straight line " ℓ ", in the form of $y = mx + c$



(25) Find the 8th term of the geometric progression

$\frac{1}{2}$, 1, 2, ...

Part B

(1) To build a house, Nimal borrowed $\frac{1}{3}$ of the total amount from a bank and $\frac{1}{4}$ of the total amount from his parents. Then he borrowed $\frac{2}{5}$ of the remaining amount from his friend.

(i) Find what fraction of the total amount was borrowed from the bank and parents.

(ii) Find what of the total amount was borrowed from his friend.

(iii) Nimal spend Rs. 750 000 of his own money and the amount of money borrowed from the others to build the house completely. Find the total amount of money he spend to build the house.

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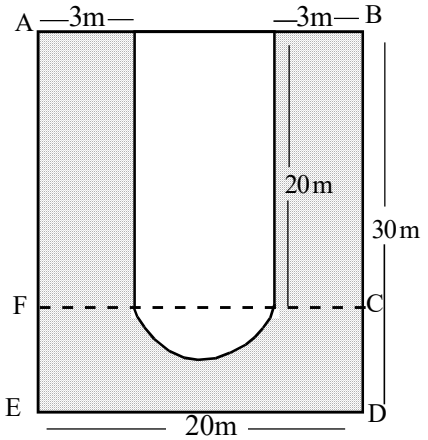
(2) The sketch of the floor plan of a shopping complex is shown in the figure. The shaded region is allocated for vehicle park and the building is in the remaining part.



(i) Find the radius of the semi-circular section of the vehicle park.

(ii) Find the perimeter of the building.

(iii) Find the area of the vehicle park.

(iv) It is proposed to lay concrete slabs on the parking lot. The price of $1m^2$ of a concrete slab is Rs. 1500. Calculate the total expenditure for laying concrete slabs on the parking lot.

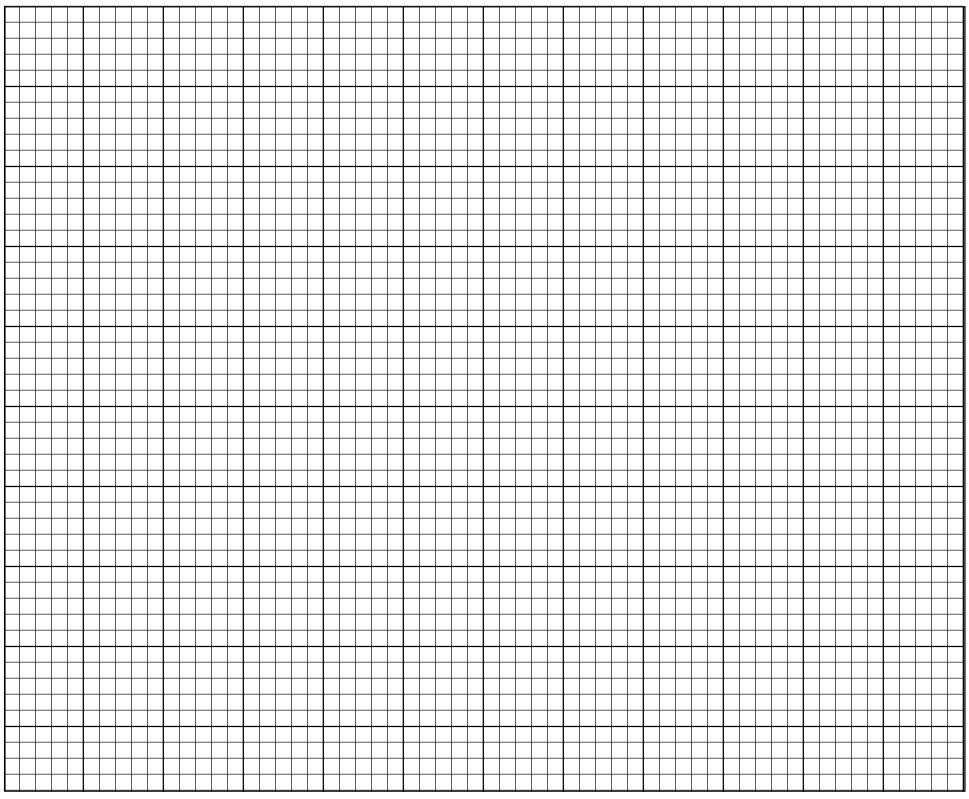
---

(3) The frequency distribution prepared from the data collected by measuring the time taken by 30 students to read a short-story book is given below.

Time (minutes)	0 - 5	5 - 10	10 - 15	15 - 20	20 - 35	35 - 45
No of students (frequency)	2	4	.....	6	9	4

(i) Fill in the blanks in the table.

(ii) Illustrate this information in a histogram.



(iii) Draw the frequency polygon on this histogram.

(iv) Express the number of students who read the short-story book, less than 15 minutes, as a percentage of the total number of students.

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(4) *(a)* Piyal deposited Rs. 175 000 in an account paying 11% annual interest compounded yearly. How much money will he receive after 2 years.

(b) Tharindu invested Rs. 360 000 and bought shares in a company at market price of Rs. 60 per share. The company pays annual dividends of Rs. 8 per share.

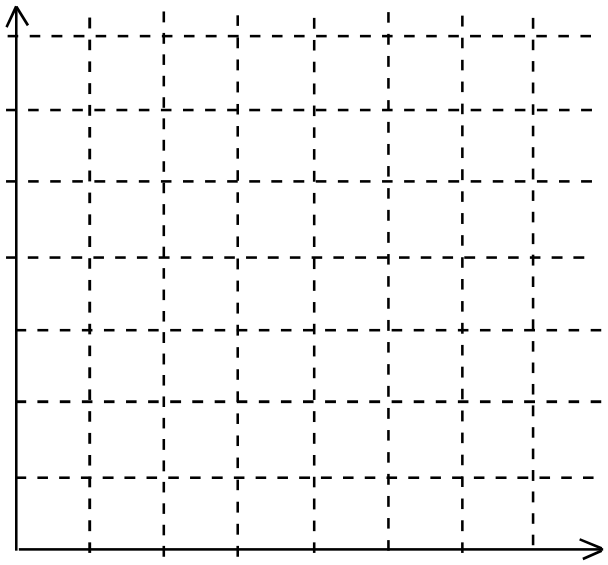
(i) Find the number of shares Ganesh bought.

(ii) Find the annual dividends income that Ganesh received from this invesment.

(iii) At the end of the year, he sold his shares on an occation when the market price increased. His capital gain from this sale was Rs. 9000. What was the selling price of a share?

(5) In a bag, there are 4 red apples and 2 green apples are of the same size and shape. Nisal draws an apple randomly from the bag, notes down it's colour and returns it back to the bag. Then Sapumal repeats this process.

(i) Represent the relevant sample. Space in the grid shown below.



(ii) Find the probability of the event of drawing a red apple by both Nisal and Sapumal

(iii) Find the probability of the event of drawing a red apple by Sapumal and green apple by Nisal

(iv) Find the probability of the event of not drawing a red apple by Nisal.

(v) Name the above events in (ii), (iii) and (iv) as A, B and C respectively.
Select and write 2 mutually exclusive events from A, B and C.

Provincial Department of Education - NWP

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Second Term Test - Grade 11 - 2019

දෙවන වාර පරීක්ෂණය - 11 ශ්‍රේණිය - 2019

Name/Index No: ..... **Mathematics - II**

Time: 03 hours and 10 minutes

- **Answer 10 questions selecting five questions from part A and five questions from part B.**
- **Each question carries 10 marks.**
- **Denote the relevant steps and correct units.**
- **The volume of a right circular cone of base radius *r* and height *h* is $\frac{1}{3}\pi r^2 h$ and the volume of a sphere of radius *r* is $\frac{4}{3}\pi r^3$.**

Part A

(1) (a) When importing a certain electrical equipment, customs duty of 55% of its value has to be paid. If the value of the equipment which was imported is Rs. 28 000,

(i) Find the value of the equipment after the customs duty is paid.

(ii) If it is marked Rs. 56 420 as the selling price of that equipment, find the expected profit percentage.

(iii) It is earned a profit of 28% when selling the above equipment by giving a discount. Find the discount given?

(b) Rs. 1800 has to be paid as quarterly rates for a certain house. If the relavent provincial council charges 15% of the assessed annual value of the house as rates, find the assessed annual value of the house.

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(2) An incomplete table values prepared to draw the graph of the function $y = (x+2)^2 - 5$ is given below.

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

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

(ii) Using the scale of 10 small divisions representing one unit along the x - axis and along the y - axis, draw the graph of the above function.

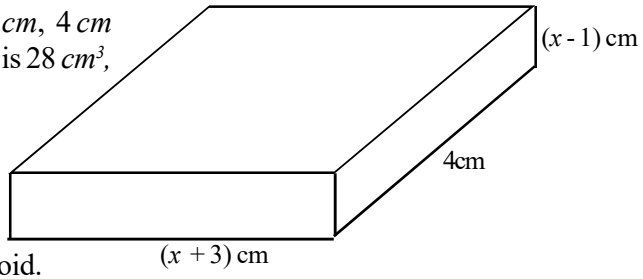
(b) Using the graph,

(i) Write the coordinates of the turning point.

(ii) Write down the interval of values of x for which $y \leq -2$.

(iii) Find the roots of the equation $(x+2)^2 - 5 = 0$ and there by find the value of $\sqrt{5}$.

(3) The length, breadth and height of a cuboid are $(x+3)\ cm$, $4\ cm$ and $(x-1)\ cm$ respectively. If the volume of the cuboid is $28\ cm^3$,



(i) Show that x satisfies the quadratic equation $x^2 + 2x + 10 = 0$ and then find the value of x to the nearest first decimal place.

(ii) Find seperately the length and height of the cuboid.

(Take $\sqrt{11} = 3.317$)

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(4) (a) It is spent Rs. 175 to buy two apples and five guavas. 10 guavas can be bought to the amount which is needed to buy 3 apples.

(i) By taking the price of an apple as Rs. x and the price of a guava as Rs. y, build up a pair of simultaneous equation.

(ii) Find seperately the price of an apple and the price of a guava by solving the above pair of equation.

(b) $(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$

Using the above result write the expansion of $(x-2)^3$.

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(5) Nimal has travelled to the bus stop A in the town. Then he tavels a distance of 200 m on a bearing of 045^0 and reaches to the bank B. After that by travelling 300m on a bearing of 100^0, he reaches to the market.

(i) Represent the way of Nimal in a sketch.

(ii) By using a suitable scale draw a scale diagram to represent above information.

(iii) Using the scale diagram find the distance from bus stop to the market.

(iv) Find the bearing of A from C.

---

(6) Information on the number of yoghurts which is sold during 30 days in a canteen of a hospital is given in the following table. The selling price of a yoghurt is Rs. 35.

No. of yoghurts	20 - 29	30 - 39	40 - 49	50 - 59	60 - 69	70 - 79	80 - 89
No.of days	1	2	6	8	7	4	2

(i) Find the mean number of yoghurts which is sold in a day to the nearest whole number.

(ii) The owner of the canteen buys a stock of yoghurts which is needed for 2 weeks from a whole sale market at the price of Rs. 25 per each. But the owner of the canteen said that the profit that he obtained by selling yoghurts at the end of two weeks does not exceed Rs. 8000. Explain with reasons whether this statement is true or false.

Part B

(7) The 15^{th} term of a geometric progression is 31. In this progression the 13^{th} term is three times of 4^{th} term.

(i) Find the first term and the common ratio of the progression.

(ii) Find the number of initial terms that need to added for the sum to be equal to 48.

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(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 ABD where AB = 8cm, AD = 5cm, and $B\hat{A}D = 60^0$

(ii) Construct the quadrilateral ABCD such that C lies at equidistance from the points B and D, and the length of diagonal AC is 9cm.

(iii) Draw the straight line which is parallel to BD through C and name the point where it meets AB produced as E.

(iv) Show that, the area of ABCD = the area of Δ ADE.

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(9) Two solid metal spheres are made by using half of the volume of metal received by melting a right circular cone with base radius "a" and the height "2a". By using the remaining half of the volume of metal, a cubical metal plank is made.

(i) Find the volume of metal plank in terms of *a.*

(ii) Find the radius of one sphere in terms of *a.*

(iii) Find the side length of the cubical shaped metal plank in terms of *a.*

(iv) If $\pi = 3.142$ and $a = 12.5$ cm by using logarithms table find the side length of the metal plank to the nearest first decimal place.

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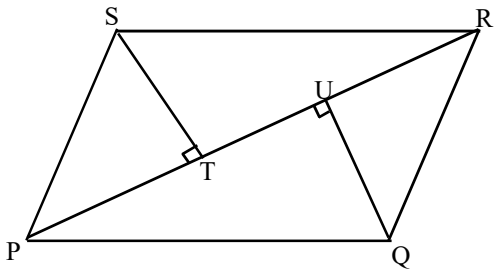
(10) In the parallelogram PQRS shown in the figure the perpendiculars drawn from the points S and Q to the diagonal PR meets at U and T respectively.



(i) Show that STQU is a parallelogram.

(ii) Show that,

$$\frac{\text{Area of PQRS}}{\text{Area of STQU}} = \frac{PR}{TU}$$

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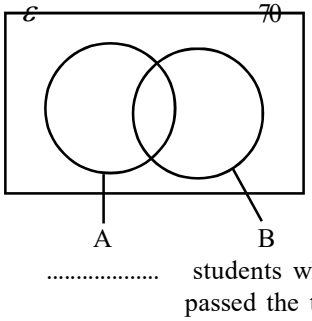
(11) In a mix school 70 students are newly joined for grade 6. They have to faced to a written test for slecting to the English medium class. According to result of the written test, it is revealed that 38 students have passed the test and 20 of them are boys.



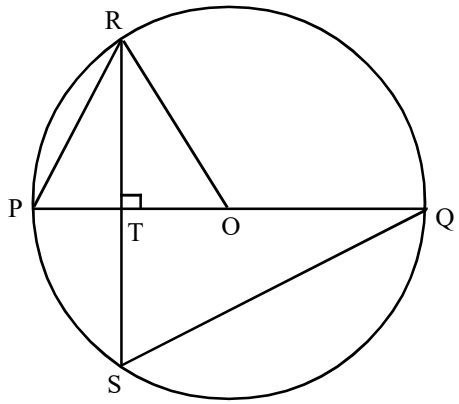
(i) Copy the incomplete Venn diagram in your answer script and represent the above information in it. Name the set A.

(ii) In the venn diagram, shade the region which represent the girls who passed the test.

(iii) If the number of girls who failed the test is 15, find the number of boys who are newly joined for grade 6.

(iv) What is the probability of a selected student being a boy who failed the written test among newly joined students.

(12) A circle with centre O is shown in the figure. The diameter PQ and the chord SR are intersected at T perpendicularly.



(i) Show that the triangles PRT and SQT are equiangular.

(ii) If ST = 9cm and PT = 3cm, find the length of TQ.

(iii) Show that $P\hat{Q}R = S\hat{Q}R$