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சபரகமுவ மாகாண கல்வித் திணைக்களம்

Sabaragamuwa Provincial Department of Education

Third Term Test 2020 **Grade 11**

Mathematics I

Two hours

Index Number

.....

Important

*This question paper consist of 8 papers

*Write your index number in the appropriate places on this paper and on page three

*Answer all questions on this paper it self

*Use the space provided under each question for working and writing the answer

*Marks are awarded as follows
In part A - 2 marks for each question
In part B – 10 marks for each question

		Question numbers	Marks
Paper 1	A	1-25	
	B	1	
		2	
		3	
		4	
		5	
		Total	
Paper II	A	1	
		2	
		3	
		4	
		5	
		6	
	B	7	
		8	
		9	
		10	
		11	
		12	
Total			

Total marks (I and II)	
Final mark	%

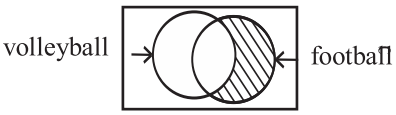
Part A

Answer all questions on this paper itself . 2 marks are awarded for one question

01. Simplify. $\frac{1}{3x}+\frac{3}{x}$

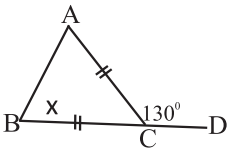
02. To finish a certain work it needs 50 man days to be worked . What is the remaining part of the work in man days when 4 men worked for 9 days .

03. Following Venn diagram shows the information obtained from the members of a sports club about their willingness for volleyball and football games . Describe the shaded region in words .



04. $2x - 1 \leq 3$ Solve the inequality and write all positive integer solutions of it .

05. In the diagram AC = BC . If $A\hat{C}D = 130^0$ find the value of $A\hat{B}C$.

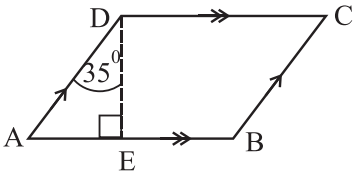


06. Express in logarithm form $2^{-3} = 0.125$

07. Find the time it takes to fill an empty tank with water by a tube in which water is flowing at the rate of 40 liters per a minute.

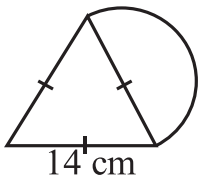
08. Find the factors. $100 - x^2$

09. ABCD is a parallelogram . Find the value of $B\hat{C}D$



10. If $A = [3 \quad -1]$ and $B = \begin{bmatrix} 2 & 1 \\ 1 & 3 \end{bmatrix}$ find AB.

11. Showing in the given figure, there is a semicircular sector upon one side of an equilateral triangle. Find the perimeter of the composite figure.



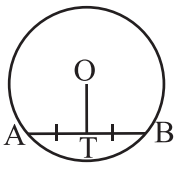
12. The assessed annual value of a shop building is Rs. 60 000. Rs. 2 250 was paid as rates for a quarter for it . What is the percentage of rates charged by that local government authority?

13. Fill in the blanks with suitable geometrical terms .

The line joining the mid points of two sides of a triangle is …… to the remaining side , and it is equal to the …….. of the length of the remaining side .

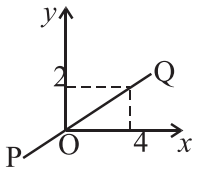
14. Find the common ratio of the geometric progression in which the first term is 2 and the fourth term is 54 .

15. AB is a chord of the circle in which the center is O. Mid point of AB is T. According to the data shown on the diagram mark (✔) if the expression in the table is correct and mark (×) if it is wrong.



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

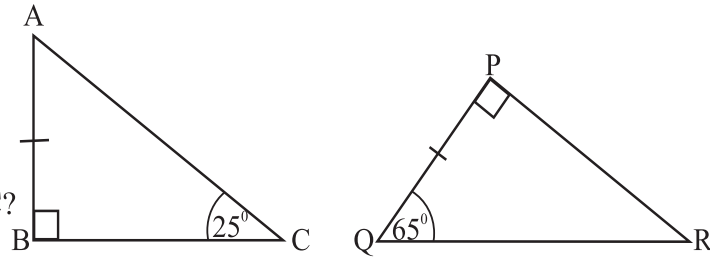
16. Write the equation of the straight line PQ shown on the diagram.



17. Triangles ABC and PQR are congruent. According to the data shown on the diagram,

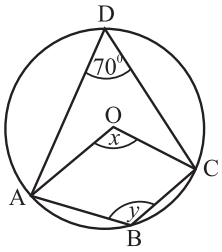
(i) State the case of conguency

(ii) What is the equal side for the side BC?



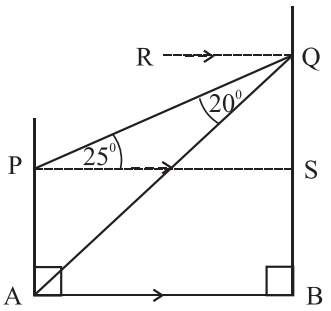
18. What is the probability of having an odd number when a fair cuboid shaped dice in which numbers from 1 to 6 are marked, is tossed once.

19. A,B,C,D are four points on the circle in which the center is O . According to the given data find the values of x and y



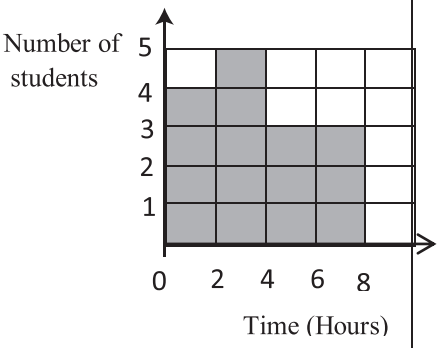
20. Solve $5-\frac{6}{x}=2$

21. AP and BQ are two houses and P and Q are two windows of them.AB is a flat land. According to the data marked on the diagram name the angle of depression of A when observed from Q and find the magnitude of it .

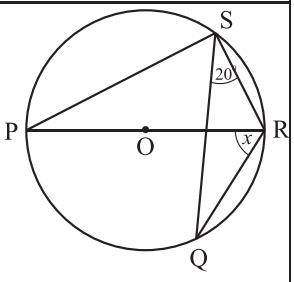


22. The histogram given here represents the information about the number of hours spent for studying at home by a group of students. Accordingly complete the blanks of the given table.

Hours	number of students
0-2	4
2-4	----
4-8	----

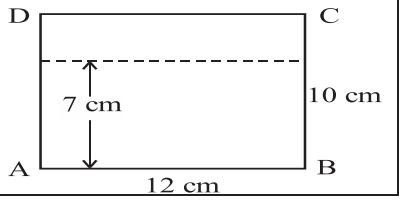


23. P,Q,R,S, are points on the circle in which the center is O . Find the value of x



24. The area of the cross section of a right solid prism is 240 cm^2 . If the height of it is 15 cm find the volume of the prism

25. ABCD is a rectangular lamina . A small hole P is to be made there with a 7 cm distance from the AB edge and 10 cm distance from the point D . Show by a rough sketch on this diagram , how to locate the point P



Part B

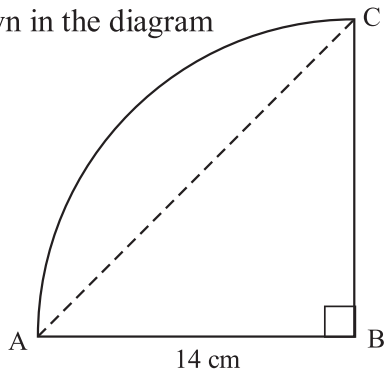
01. Raja spends a certain portion of the annual profit of his business for welfare activities . $\frac{1}{3}$ of it is to be spent for religious activities and $\frac{1}{4}$ is for developing the education facilities of the area . He intends to donate $\frac{2}{5}$ of the remainder to volunteer organizations in the area .

i. What fraction of the total amount is spending for religious and educational activities ?

ii. What fraction of the whole amount is separated for volunteer organizations ?

iii. If Rs. 30 000 is remaining after separating for religious and educational activities and volunteer organizations , what is the total amount of money separated for all welfare activities.

2. A rough sketch of a compound in the shape of a sector is shown in the diagram



i. Find the length of the arc AC

ii. Flower plants are planted in the area of the segment separated by the straight line AC .What is the area of that segment ?

iii. Another rectangular part equal to three times of the area where flowers are planted , is to be added to the compound . AB must be one boundary of it . Draw the rough sketch of it on the given diagram showing the relevant measurements

iv. Find the perimeter of the whole compound including the newly added part also .

3. Mayura invested money on shares of companies A and B . The market price of a share and the dividend paid per a share in each company is shown in the table given below

	Market price of a share	dividend per a share
Company A	Rs. 80	Rs. 6
Company B	Rs. 120	Rs. 8

i. If 240 shares of company A is bought find the dividend income of received from A

ii. If the dividend income of company B is Rs. 720 find the amount invested in company B

iii. Find the total amount invested in both companies .

iv. If he has invested the total amount in company A only , by what amount the dividend income would be increased

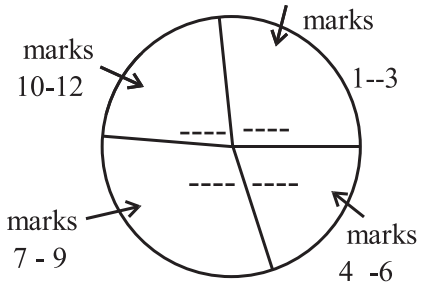
4. (a) Number of marks obtained by grade 10 students in a test for aesthetic subject are as follows

2 ,2 ,3 ,3 ,4 ,6 ,6 ,7 ,8 ,8 ,8 ,9 , 9 ,10 , 12

Find the first and third quartiles of this group of marks, and then find the interquartile range of it

(b) The number of students in the above group is separated in to four equal class intervals

Marks obtained	students	angle of the sector
1 - 3	4	96^0
4- 6	3	72^0
7- 9	---	----
10-12	---	----



i. Complete the column of students

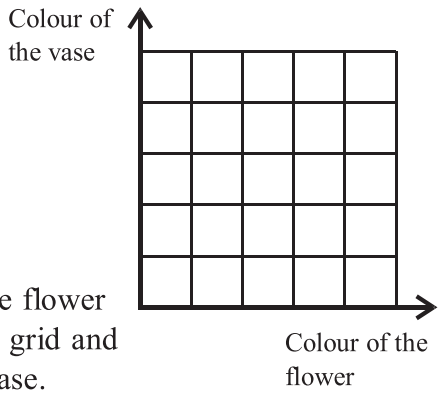
ii. Complete the column "angle of the sector"

iii. According to the completed columns enter the magnitudes of angles in the pie chart

iv. Because of a correction of marks ,angle of the sector of the class interval 4 – 6 is changed to 120^0. How many students are increased in that class interval ?

5. (a) Ruvini bought 5 plants of Anthuriams .Three of them are blossoming red flowers(R) and two of them are blossoming white flowers(W). To plant them she bought five flower vases also.Three of the vases are red (R) in colour and two vases are black in colour (B)

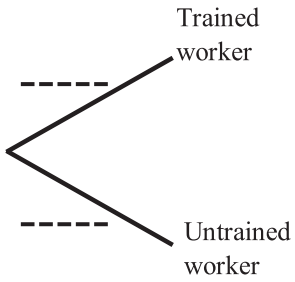
i. One plant is planted by selecting a plant and a vase at random. Mark the sample space of all possible outcomes of selecting a plant and a vase, by" × 'marks on the given grid.



ii. Indicate the events that shows selecting the colour of the flower and the colour of the vase are same by encircling it in the grid and find the probability of selecting a same colour plant and a vase.

(b) There are 12 workers in a certain work place. 8 workers out of them are trained workers and the others are untrained. Manager of the work place selected a worker at random and appointed him to a certain work to finish within one week .

i. Complete the following tree diagram to represent the probabilities of the selected worker being a trained one or untrained one



ii. It is believed that ,if the selected worker is a trained one the probability of finishing the given work in one week is $\frac{3}{4}$ and if the selected worker is an untrained one ,the probability of finishing the work in one week is $\frac{1}{2}$ .Extend the given tree diagram to represent the relevant probabilities .

iii. Find the probability of the selected worker being able to finish the given work in one week time .

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Sabaragamuwa Provincial Department of Education

Third Term Test 2020 **Grade 11**

Mathematics II | ***Three hours***

- Select 5 questions from part A and 5questions from part B and answer 10 questions only
- Write the relevant steps and correct units in answering the questions
- Each question carries 10 marks
- The volume of a right circular cone with the base radius r and right height h is $\frac{1}{3}\pi r^2 h$
- The volume of a right circular cylinder with the base radius r and right height h is $\pi r^2 h$

Part A

Answer 5 questions only

01. An incomplete table showing the y values corresponding to several x values of the quadratic function $y = 5-(x-1)^2$ within the interval $-2 \le x \le 4$ is given below

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

i. Find the value of y when $x = 4$

ii. Using the standard system of axes and a suitable scale , draw the graph of the given quadratic function on a graph paper

iii. Draw the axis of symmetry of the graph and write the equation of it

iv. Write the range of x values which satisfies the inequalities $0 > x$ and $0 < y$

v. The graph of the function $y = 5 - x^2$ can be obtained by changing the location of the drawn graph .Find the values of x when y = 0 of the graph $y = 5 - x^2$

02. Jayanatha borrowed Rs. 60 000 from a financial institute to repair his house . It is to be paid back in 10 equal monthly installments with 16% annual interest rate . The interest is calculated according to the reducing balance.

i. Find the value of a monthly installment

ii. If the above mentioned loan is taken under 1% monthly simple interest rate, show that the interest to be paid after ten months is greater than the interest paid in installments as calculated in above (i)

03. The masses of chilly harvest that Isuru plucked from his chilly cultivation in 28 turns are as follows.

Mass (kg)	20-24	24-28	28-32	32-36	36-40	40-44	44-48
Number of Times	2	4	6	9	3	2	2

(20 – 24 means , 20 or more than 20 and less than 24)

i. According to the table find the mean mass of chilies plucked in one turn

ii. If the price of one kilogram of chilies is Rs. 450 what is the income that he can expect to receive by selling chilies in first 20 turns .

iii. After the first 28 turns, the mean mass of chilies plucked in next 7 turns is 23 kg . What is the mean mass of chilies plucked in whole 35 turns

04. Sadik is a fruit seller . One day he bought a stock of watermelons of 160 kg and separated it into two heaps as big ones and small ones . He sold big watermelons for Rs. 100 each and small ones for Rs. 80 each .

- The number of big melons is 30 more than the small melons
- The income received by selling big melons is Rs. 4700 more than the income received by selling small melons .

i. Build up a pair of simultaneous equations by taking the number of big melons as x and the number of small melons as y and by solving them find the number of melons in each type

ii. If he has bought one kilogram of melons for Rs. 70 show that the total profit he receives by selling melons is Rs. 7100

05. (a) An observer who is standing 40 m distance away from a vertical tower on a flat land sees the top of a tower with an angle of elivation 30^0 .

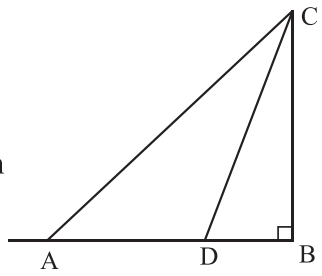
i. Draw a scale diagram by representing 5 m of the actual distance by 1 cm

ii. Using the scale diagram find the height of the tower correct to the nearest meter .

(b) AB is a flat ground and BC is one side of a building . AB = 80 m and the angle of elivation of C from A is 43^0

i. Find the height of BC

ii. If the point D is situated between A and B and CD = 80 m find the magnitude of the angle BDC



06. The base radius of a right solid cylinder is r and the height of it is 4 cm more than the radius

i. Denote the height of the cylinder using " r "

ii. If the area of the curved surface of it is 88 cm^2 show that ' r' satisfies the quadratic equation $r^2 + 4r - 14 = 0$ $\left(\pi = \frac{22}{7}\right)$

iii. By solving this equation show that the base radius of the cylinder is $3\sqrt{2} - 2$ and by using it find the height of the cylinder $\left(\sqrt{2} = 1.41\right)$

Part B – Answer five questions only

07. (a) On a board prepared for an activity of mathematics in primary classes , there are small squares drawn and numbered from 1 to 20 respectively . On each square a certain number of buttons are kept and the number of buttons so kept are in an arithmetic progression such that the number on each square is three more than the number on the previous square .

When 6 boxes including 100 buttons in each one are using to keep buttons like this it seems that the number of buttons on the 18^{th} square is 58 but the remaining number is not enough to complete the 19^{th} square . Find the number of buttons remaining after keeping on the 18^{th} square.

(b) The sum of the first 6 terms of a geometric progression is 381 . Find the 7^{th} term of this progression.

08. Use only a straight edge with cm / mm scale and a pair of compasses for the following constructions.The construction lines should be drawn clearly .

i. Draw the straight line AB = 7 cm and construct the perpendicular bisector of it

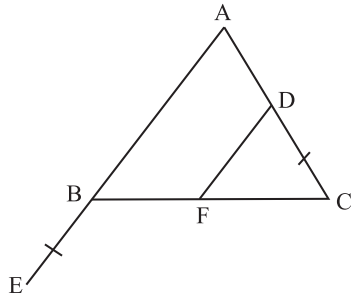
ii. Construct the circle in which AB is a chord and the radius is 4 cm. Name the centre of the circle as O

iii. Construct a tangent to the circle at A and name it as MAT .

iv. Construct a parallel line to the tangent AT at B and name the point it intersect the circle as C

v. Name an angle equal to $A\hat{C}B$ and give reasons for it .

09. In the triangle ABC , AB = AC . D is on the line AC . Line AB is produced such that CD = BE . DF is drawn parallel to AB .



i. Prove that DFC is an isosceles triangle .

ii. If the lines BC and DE intersect at T prove that $\Delta BTE \equiv \Delta$ DFT

iii. Prove that BDFE is a parallelogram.

iv. Write an equal ratio to $\frac{DF}{AB}$

10. The thickness of a solid metal cylindrical plate in which the radius is r is $\frac{3}{4}$ cm .

i. Find the volume of the plate in π and r

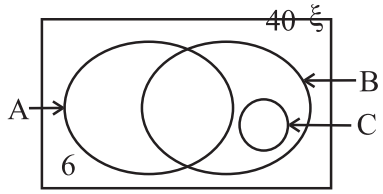
ii. Find the volume of a solid metal cone in which the base radius is 2r and right height is 6 cm , in π and r

iii. The cone is made by melting 12 metal plates . If 99 cm^3 of metal is remaining after the making of the cone show that $r = 3\sqrt{\frac{11}{\pi}}$

iv. Using the logarithm tables find the radius of a cylindrical metal plate . Take $\pi = 3.14$

11. In an exhibition of a school ,in the stall run by the past pupils association there were shirts , umbrellas , and caps in school colours to be sold . As the number of caps is limited ,caps are issued to customers only who buys a shirt . .

In a certain time period 40 people came to the stall and the following incompleted Venn diagram shows the information about their buying . Copy this Venn diagram to your answer script and complete it according to the given data .



i. "A" shows the people who bought umbrellas . Name the two sets B and C appropriatly .

ii. Number of people who bought umbrellas is 25 and number who bought shirts is 22. What is the number of people who bought only umbrellas.

iii. The number of people who bought only two types of items from above three types is 19 . How many people have bought caps ?

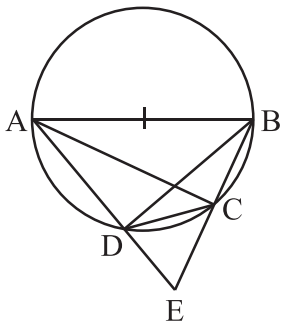
iv. Name the set who bought only shirts, in set notation using A , B and C

12. In the triangle ABE , AB = AE . The circle in which the diameter is AB intersect the lines BE and AE at C and D respectively .

i. Prove that Δ ABC $\equiv$ Δ AEC

ii. The tangent drawn to the circle at C intersect the line AE at T.

Prove that DT = TE



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Third Term Test 2020 **Grade 11**

Mathematics I A

Answer

1.	$\frac{10}{3x}$ $\frac{1}{3x}+\frac{9}{3x}$ ---- 1	②
2.	මිනිස් දින 14 4×9 හෝ 36 ---- 1	②
3.	පාපන්දුවලට පමණක් කැමති.	②
4.	1, 2 $2x \leqslant 4$ හෝ $x \leqslant 2$ හෝ 1 හෝ 2 පමණක් ---- 1	②
5.	$x = 65^0$ $C\hat{A}B = C\hat{B}A$ හෝ $2x$=130 රූපයේ දක්වීම ---- 1	②
6.	$\log_2 0.125 = -3$	②
7.	මිනිත්තු18 $\frac{720}{40}$ ---- 1	②
8.	$(10 - x)(10 + x)$ 10^2 හෝ $10^2 - x^2$ ---- 1	②
9.	55^0 $D\hat{A}E = 55^0$, 90 - 35 ----- 1	②
10.	[5 0] 3×2+(-1×1) හෝ 3×1+(-1)×3 ---- 1	②
11.	50 cm $\frac{1}{2}\times\frac{22}{7}\times14$ හෝ 22 ---- 1	②
12.	15% 2250 × 4 හෝ $\frac{9000}{60000}\times100\%$ ---- 1	②
13.	සමාන්තර අඩකට	① ①

14.	3 $2\times r^3 = 54$ ---- 1	
15.	✓ ✓	
16.	$y = \frac{1}{2}x$ $m = \frac{2}{4}$ හෝ $\frac{1}{2}$ හෝ $\frac{2-0}{4-0}$ ---- 1	②
17.	කෝ.කෝ.පා. ----1 BC = PR ----1	②
18.	$\frac{1}{2}$ හෝ $\frac{3}{6}$ {1 2 3 4 5 6}හෝ 1, 3, 5 ---- 1	②
19.	$x = 140^0$ $y = 110^0$	① ①
20.	$x = 2$ $\frac{-6}{x} = -2$ හෝ -3x = -6 ---- 1	②
21.	$R\hat{Q}A$ 45^0	① ①
22.	5 6	① ①
23.	70^0 $90^0 - 20^0$, $P\hat{S}R = P\hat{R}Q$ හෝ $P\hat{S}R = 90^0$ ---- 1	②
24.	3 600 cm^2 240×15 ---- 1	②
25.	චාපය සමග P ලක්ෂ්‍යයට චාපය ---- 1	②

1.	i.	$\frac{1}{3}+\frac{1}{4}=\frac{7}{12}$	---- ①+①
	ii.	$1-\frac{7}{12}=\frac{5}{12}$	---- ①
		$\frac{5}{12}\times\frac{2}{5}=\frac{1}{6}$ හෝ $\frac{2}{12}$	---- ① + ①
	iii.	$\frac{7}{12}+\frac{2}{12}=\frac{9}{12}$ හෝ $\frac{3}{4}$	---- ① + ①
		$1-\frac{3}{4}=\frac{1}{4}$	---- ①
		$\frac{1}{4}\rightarrow 30000$	
		වෙන්කළ මුදල 30 000 × 4	---- ①
		රු. 120 000	---- ①——— ⑩
2.	i.	$2\times\frac{22}{7}\times 14\times\frac{1}{4}=22$	---- ① + ①
	ii.	$\left(\frac{22}{7}\times 14\times 14\times\frac{1}{4}\right)-\left(\frac{1}{2}\times 14\times 14\right)$	---- ① + ①
		154 - 98 = 56 cm^2	---- ①
	iii.	3 ×56 = 168 m^2	---- ①
		$\frac{168}{14}$ = 12 m^2	---- ①
		රූපයේ දැක්වීමට	---- ①
	iv.	22+12+14+12+14 = 74 m	---- ① + ①——— ⑩
3.	i.	240 × 6 = රු.1440---- 1+ 1	②
	ii.	$\frac{720}{8}=90$ ---- 1 + 1	
		90 × 120 = රු. 10800 ---- 1	③
	iii.	240 × 80 = 19200 ---- 1	
		19200 + 10800 = 30000 ---- 1	②
	iv.	$\frac{30000}{80}\times 6=2250$ ---- 1	
		1440 + 720 = 2160 ---- 1	
		2250 - 2160 = 90 ---- 1	③——— ⑩

4. (a) 3, 9 ---- 1 + 1

6 ---- 1

(b)i. 6, 2 ---- 1

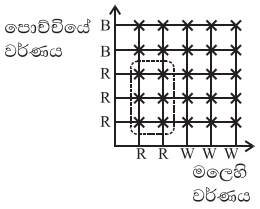
ii. 144^0, 48^0 ---- 1 + 1

iii. රූපයේ දැක්වීමට ---- 1

iv. $\frac{360}{15} = 24$ ---- 1

$120^0 - 72^0 = 48^0$ ---- 1

$\frac{48}{24} = 2$ - ළමුන් දෙකයි ---- 1 ——— ⑩

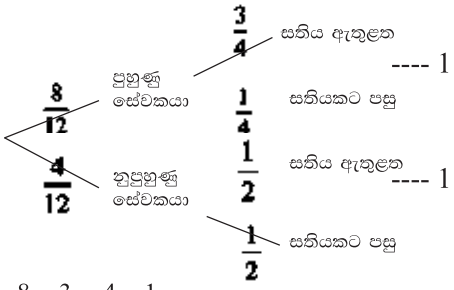
5. (a) i. 

---- 2

ii. $\frac{6}{25}$ ---- 1

වටකොට දැක්වීමට ---- 1 ④

(b) i. නිවැරදි සම්භාවිතාවලට ---- 1

ii. 

iii. $\frac{8}{12} \times \frac{3}{4} + \frac{4}{12} \times \frac{1}{2}$ ---- 1+1

$\frac{4}{6}$ හෝ $\frac{2}{3}$ හෝ තුල්‍ය භාගයක් ---- 1 ⑥——⑩

II පත්‍රය

01.	i.	$x=4$ වන විට $y=-4$	1	①		
	ii.	නිවැරදි අක්ෂ	1			
		නිවැරදි ලක්ෂ්‍ය	1			
		සුමට වක්‍රය	1	③		
	iii.	$x=1$	1			
		අක්ෂය ඇඳීමට	1	②		
	iv.	$-1.2(\pm 0.1) < x < 0$	1+1	②		
	v.	$-2.2(\pm 0.1) < x < 2.2(\pm 0.1)$	1+1	②	⑩	

02.	i.	$\frac{60000}{10}=6000$	1			
		$6000\times\frac{16}{100}\times\frac{1}{12}=80$	1+1			
		$\frac{10}{2}\times 11=55$	1			
		80×55	1			
		$60\,000+4\,400=64\,400$	1			
		$\frac{64400}{10}=$ රු. 6 440	1	⑦		
	ii.	$60000\times\frac{1}{100}\times 10=6000$	1+1			
		$4\,400 < 6\,000$	1	③	⑩	

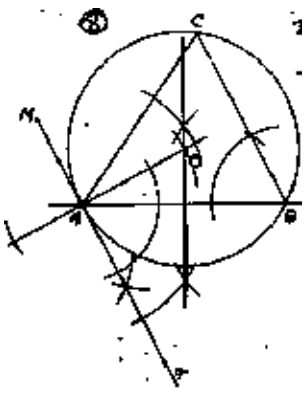
03.	i.		x	f	fx				
		20-24	22	2	44				
		24-28	26	4	104	x තීරය	1		
		28-32	30	6	180	fx තීරය	1		
		32-36	34	9	306	Σfx	1		එක් වරදක් නොසලකන්න
		36-40	38	3	114	$\frac{924}{28}$	1		
		40-44	42	2	84	33	1	⑤	
		44-48	46	2	92				
				28	924				
	ii.	$33\times 20\times 450=$ රු.297 000					1+1	②	
	iii.	$23\times 7=161$					1		
		$161+924=1085$					1		
		$1085/35=31$ kg					1	③	⑩

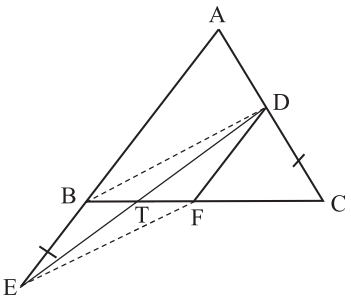
04.	i.	$x - y = 30$	1			
		$100x - 80y = 4\,700$	1			
		$20x = 2300$ හෝ $20y = 1700$	1			
		$x = 115$ හෝ $y = 85$	1			
		ආදේශයට	1			
		$y = 85$ හෝ $x = 115$	1	⑥		
		ලොකු ගෙඩි ගණන 115, පොඩි ගෙඩි ගණන 85				
	ii.	$115\times100+85\times80=11500+6800$	1+1			
		$70\times160 = 11200$	1			
		$18300 - 11200 = 7100$	1	④	⑩	අගයයන් අඩු කිරීමට

05.	(a)i.	8 cm ඇඳීමට	1			
		පරිමාණ රූපයට	1	②		
	ii.	පරිමාණ උස -- 5.6 cm(±0.1)	1			
		සැබෑ උස -- 28 m(±1)	1	②		
	(b)i.	$\tan 43^0 = \frac{BC}{80}$	1			සූත්‍රයට හෝ
		$0.9325 = \frac{BC}{80}$	1			ටෑන් අගය සඳහා
		BC = 74.6 m	1	③		
	ii.	$\sin B\hat{D}C = \frac{BC}{CD} = \frac{74.6}{80} = 0.9325$	1+1			
		$B\hat{D}C = 68^0 50'$	1	③	⑩	

06.	i.	r + 4	1	①		
	ii.	$2\pi r(r+4) = 88$	1			
		$2\times\frac{22}{7}\times r(r+4) = 88$				
		$r^2 + 4r - 14 = 0$	1	②		
	iii.	$r^2 + 4r + 4 = 14 + 4$	1			සූත්‍රයට ආදේශය -1
		$(r+2)^2 = 18$	1			$\frac{-4\pm6\sqrt{2}}{2}$ - 1
		$r + 2 = \pm\sqrt{18}$	1			$\sqrt{18} = 3\sqrt{2}$ - 1
		$r = \pm3\sqrt{2} - 2 \quad = \pm3\times1.41 - 2$ 1+1				
		4.23 - 2 = 2.23	1			
		උස = 2.23 + 4				
		= 6.23 cm	1	⑦	⑩	

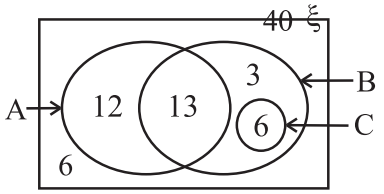
07.	(a)	$T_n = a+(n-1)d$				
		$58 = a + 17\times 3$	1			
		$a = 7$	1			
		$Sn = \frac{n}{2}(a+l)$				
		$= \frac{18}{2}(7+58)$	1			
		$=585$	1			
		$600-585=15$	1	⑤		
	(b)	$381 = \frac{a(2^7-1)}{2-1}$	1			
		$381 = a \times 127$	1			
		$a = 3$	1			
		$T_7 = 3 \times 2^6$	1			
		$= 192$	1	⑤	⑩	

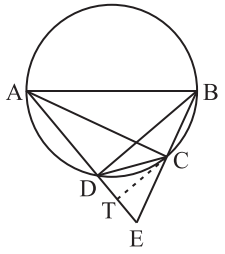
08.	i.	AB	1			
		ලම්බ සමච්ඡේදකය	2	③		
	ii.	O කේන්ද්‍රය	1			
		වෘත්තය	1	②		
	iii.	ස්පර්ශකය	1	①		
	iv.	සමාන්තර රේඛාව	2	②		
	v.	$B\hat{A}T/A\hat{B}C/M\hat{A}C$	1			
		ඒකාන්තර වෘත්ත ඛණ්ඩයේ කෝණ හෝ සුදුසු හේතුවක්	1	②	⑩	

09.	i.	$A\hat{B}C=A\hat{C}B$ (AB = AC නිසා)	1			
		$A\hat{B}C = D\hat{F}C$ (අනුරූප කෝණ)	1			
		$\therefore A\hat{C}B=D\hat{F}C$	1			
		$\therefore DF = DC$				
		DCF සමද්විපාද ත්‍රිකෝණයකි		③		
	ii.	BE = DC				
		DF = DC				
		DF = BE	1			
		$D\hat{T}F = B\hat{T}E$ (ප්‍රතිමුඛ කෝණ)				
		$D\hat{F}T = E\hat{B}T$				

		$T\hat{D}F = B\hat{E}T$	2			
		$\therefore BTE\Delta \equiv DFT\Delta$ (කෝ.කෝ.පා.)		③		
	iii	DF = BE (අංගසම ත්‍රිකෝණවල අනුරූප පාද)	1			
		DF // BE(දත්තය)				
		$\therefore$ BDFE සමාන්තරාස්‍රයකි.				
		(සම්. පාද හා සම්. කෝ. සමාන නිසා	1	②		හේතුවට
	iv.	$\frac{DF}{AB} = \frac{DC}{AC} = \frac{CF}{BC}$	2	②	⑩	

10.	i.	$\pi r^2 \times \frac{3}{4} = \frac{3}{4}\pi r^2$	1	①		
	ii.	$\frac{1}{3}\pi(2r)^2 \times 6 = 8\pi r^2$	1	①		
	iii.	$12 \times \frac{3}{4}\pi r^2 - 8\pi r^2 = 99$	1			
		$\pi r^2 = 99$				
		$r = \sqrt{\frac{99}{\pi}} = 3\sqrt{\frac{11}{\pi}}$	1	②		
	iv.	lgr = lg3 + ½(lg11-lg3.14)	1			
		=0.471 +½(1.0414 -0.4969)	2			නිවැරදි ලඝුගණක 3 හෝ 2කට --2 නිවැරදි ලඝුගණක 1කට --1
		= 0.4771+ 0.2723	1			එක් බෙදීමක් හෝ
		= 0.7596	1			
		r = 5.6	1	⑥	⑩	

11.	i.	කමිස මිලට ගත් අය	1			
		තොප්පි මිලට ගත් අය	1	②		
	ii.	40 - 6 = 34, 12 ලබා ගැනීමට	1			
		34 - 22 = 12 වෙන් රූපයේ දැක්වීමට	1	②		
	iii.	25 - 12 = 13 6 ලබා ගැනීමට	1			
		19 - 13 = 6 වෙන් රූපයේ දැක්වීමට	1	②		
	iv.	22 - (13 + 6) = 3 13 හෝ 3 දැක්වීමට	1			
		12 + 3 = 15 15 ලබා ගැනීමට	1	②		
	v.	$A' \cap C' \cap B / (A \cup C)' \cap B$	2	②	⑩	

12.	i.	AB = AE(දත්තය)				
		AC පොදුයි	1			
		$A\hat{C}B=A\hat{C}E=90^0$ (අර්ධ වෘත්තයේ කෝණ)	1			
		$ABC\Delta \equiv AEC\Delta$ (කර්ණ.,පා)	1	③		
	ii.	T ලක්ෂ්‍යය රූපයේ ලකුණු කිරීම	1			
		$B\hat{A}C=B\hat{D}C$ (එකම ඛණ්ඩයේ කෝණ)	1			
		$C\hat{A}E=D\hat{C}T$ (ඒකාන්තර වෘත්ත ඛණ්ඩයේ කෝණ)	1			
		$B\hat{A}C=C\hat{A}E$ (අංගසම ත්‍රිකෝණවල අනුරූප අංග)	1			
		$\therefore B\hat{D}C=D\hat{C}T$				
		$\therefore$ BD // CT(ඒකාන්තර කෝණ සමාන නිසා)	1			
		BDE ත්‍රිකෝණයේ				
		BD//CT (සාධනයෙන්)				
		BC = CE(අංගසම ත්‍රිකෝණවල අනුරූප අංග)	1			
		$\therefore$ DT = TE(මධ්‍ය ලක්ෂ්‍ය ප්‍රමේය)	1	⑦	⑩	හේතුවට

සබරගමුව පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව
சபரகமுவ மாகாண கல்வித் திணைக்களம்
Sabaragamuwa Provincial Department of Education

සබරගමුව පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව
சபரகமுவ மாகாண கல்வித் திணைக்களம்
Sabaragamuwa Provincial Department of Education

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අධ්‍යයන පොදු සහතික පත්‍ර (සාමාන්‍ය පෙළ) පෙරහුරු පරීක්ෂණය, 2020
General Certificate of Education (Ord. Level) Pre Test, 2020

ගණිතය **I**
கணிதம் **I**
Mathematics I

පැය දෙකයි
இரண்டு மணித்தியாலம்
Two hours

Index Number: .....

Certified Correct

.....
Signature of Invigilator

Important:

* This question paper consists of **8** pages.
* Write your **Index Number** correctly in the appropriate places on **this page** and on **page three**.
* Answer **all** questions **on this question paper itself**.
* Use the space provided under each question for working and writing the answer.
* Indicate the **relevant steps** and the **correct units** when answering the questions.
* Marks are awarded as follows:
  In Part A
  2 marks for each question
  In Part B
  10 marks for each question
* Blank papers can be obtained for scratch work.

For Marking Examiners' Use Only		
Part	**Question Numbers**	**Marks**
A	**1 – 25**	
B	**1**	
	2	
	3	
	4	
	5	
Total		

..... First Examiner	..... Code Number
..... Second Examiner	..... Code Number
..... Arithmetic Checker	..... Code Number
..... Chief Examiner	..... Code Number

[see page two

Part A

Answer all question on this paper it self

1. Select the 1st approximation of $\sqrt{67}$ using the answer given below.

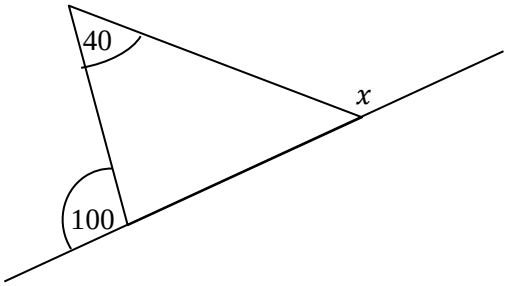
8·1 , 8·2 , 8·3, 8·4

2. Two identical pumps are taken two hours to empty a water pool. How many hours will it take to empty the same water pool using 3 identical pumps ?

3. A provincial council charges Rs. 7500 for year as rates for a property. The annual assessed value of the property is Rs. 50 000. find the percentage of annual rates.

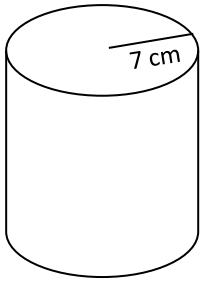
4. if $x^2 + bx + c = (x + 5)(x - 2)$, find b and c

5. Using the information given in the figure, find the value of x.

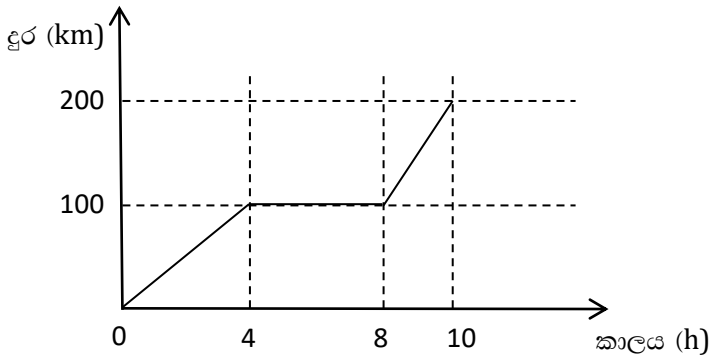


6. Represent in index form $\log_3 x = 4$

7. In the given figure, the curved surface area of a solid right circular is 220 cm^2 . Find the height of the cylinder.

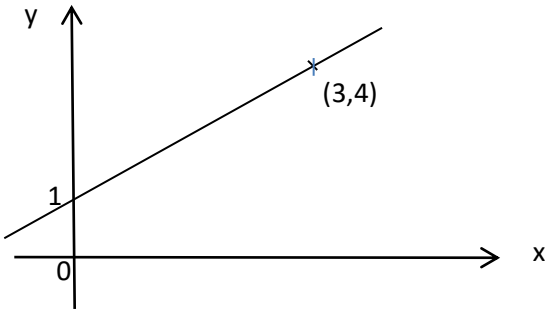


8. The following distance - time graph that represent the journey of a taxi. If Rs. 50 charges for 1 km of travelling, find the total amount charge for the journey.



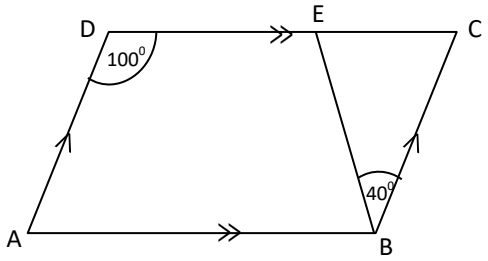
9. Simplify. $\frac{1}{2x} + \frac{1}{3x}$

10. Find the gradient of the line graph shown in the given figure.



11. Solve. $x^2 - 1 = 0$

12. Parallelogram ABCD is shown in the figure find the value of $B\hat{E}C$ according to the given information.

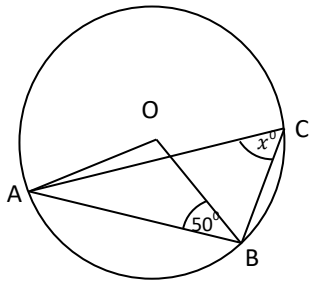


13. A man takes a loan of Rs. 50 000 under the 8% of annual interest rate. How many years taken to settle the loan by paying Rs. 8000 as total interest.

14. Write the 10^{th} term of the geometer progression where the first term 4 and the common ratio 2, as power of 2.

15. Simplify, $10x \div \frac{x^2}{y}$

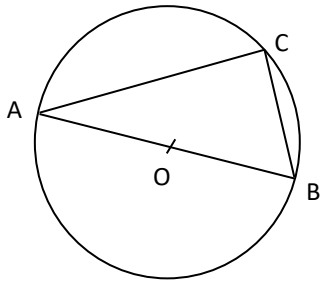
16. The center of the circle in the given figure is "O". Find the magnitude of x where $\hat{OBA} = 50^0$



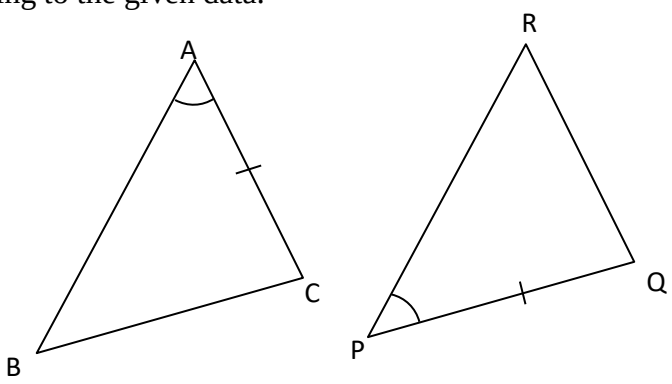
17. Find the test common multiple of the following three algebraic terms.

$2x^2$, $10xy$, $2xy^2$

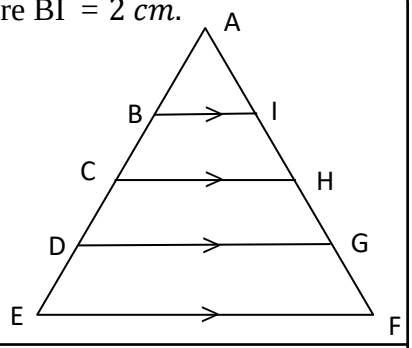
18. AB is the diameter of the circle with the Centre "O". Find the radius of the circle where AC = 8 cm and BC = 6 cm in the given figure.



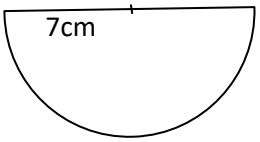
19. Write the other pair of elements to be equal to congruent the following pair of triangles.under the angle, angle, side case (A,A,S) according to the given data.



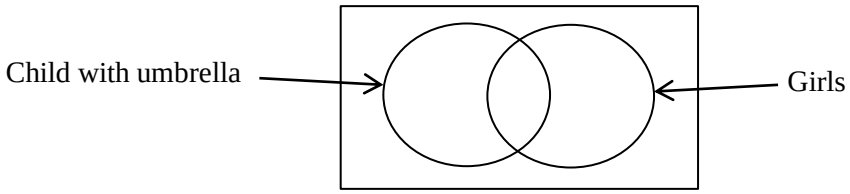
20. In the given figure AB=BC=CD=DE. Find the length of EF where BI = 2 *cm*.



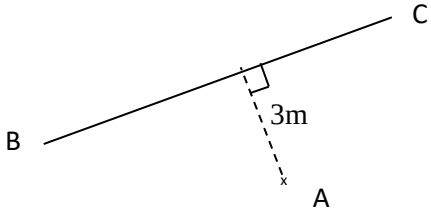
21. Perimeter of the semicircle of the radius 7 *cm* is 36 *cm* . Find the arc length of the semicircle show in the given figure.



22. In the given venn diagram, Shade the region that represent the boys.



23. It is needed to grow two trees on the BC boundary of the certain land, 5 *m* away from post "A" . Draw a sketches of the above using the knowledge of loci, named the above point as "X" and "Y".



24. 2,4,6,7,8,9,14 using the above frequency distribution. Find the inter quartile range.

25. Mark "✞" in front of the simple event among the event given below.

i	The event of getting head of tossing unbiased coin.	
ii	The event of getting even numbers, when tossing unbiased die numbered from 1 to 6.	
iii	The event of getting red bead from a bag contain 1 red and 2 white and 3 yellow bead's	

50

Part B

Answer all question on this paper it self.

1. In a country where an epidemic is spreading, people suspected of having disease are referred to quarantine. But $\frac{6}{7}$ of the people who are referred to quarantine are not having disease.

i) What fraction of total people who are referred to quarantine are having disease.

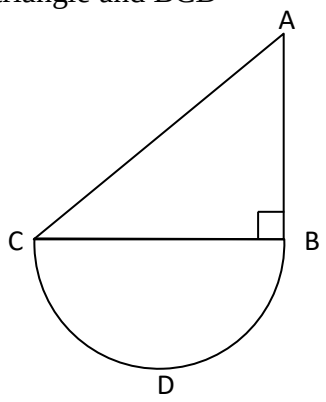
ii) $\frac{2}{3}$ Of the people who having disease in the quarantine Centre are coming from abroad. What fraction of total are coming from abroad.

iii) The rest of 15 people who having disease are in the quarantine Centre. Find the total number of people who are referred to quarantine.

iv) $\frac{3}{5}$ of total , who are referred to quarantine are male. Find the number of female are referred to quarantine.

10

2. The land consists of a portion ABC in the shape of a right angled triangle and BCD semicircular portion with BC = 28 cm.



i) Find the radius of the semicircular portion.

ii) Find the area of BCD semicircular portion.

iii) Find the length of AB where the area of ABC right angled triangle is equal to the area of BCD semicircular portion.

iv) The length of AC= 35.6 m approximately. Find the total length of wire needed to make fance 3 round around the land.

10

3. Mr.Sunil who getting loan of Rs. 40 000 at a compound interest rate of 8% per year. Then the invest that amount of loan to bought shares in a company at the market price of Rs. 20 per share. The company pays annual dividends of Rs. 3 per share.

i) Find the interest to the loan for the 1st year.

ii) Calculate the total amount required to repay the entire loan in two years.

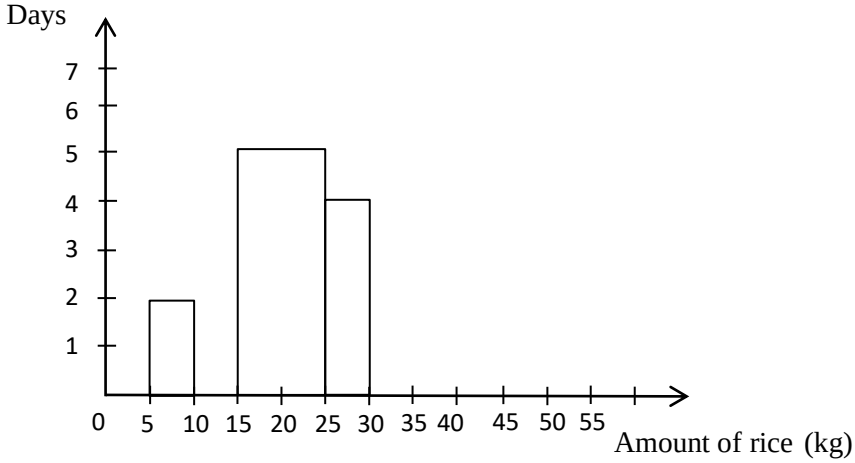
iii) Find the annual dividend's income that he receives from this investment.

iv) After two years , he sold all the shares at the current market price of Rs. 23 per share and paid off the loan together with the interest. Find the amount of money he has left at the end of the 2 years.

10

4. The following incomplete frequency distribution and corresponding incomplete histogram have been prepared using the amount of rice sold withing 30 day in a shop. "Here 15-25 denotes the amount of interval greater than 15 and less than or equal to 25" and the other intervals denotes similarly.

Amount of rice (kg)	Days
5 - 10	2
10 - 15	3
15 - 25	10
25 – 30	.....
30 – 45	9
45 - 50	.....



i) Fill in the blank of the above frequency table.

ii) Complete the histogram.

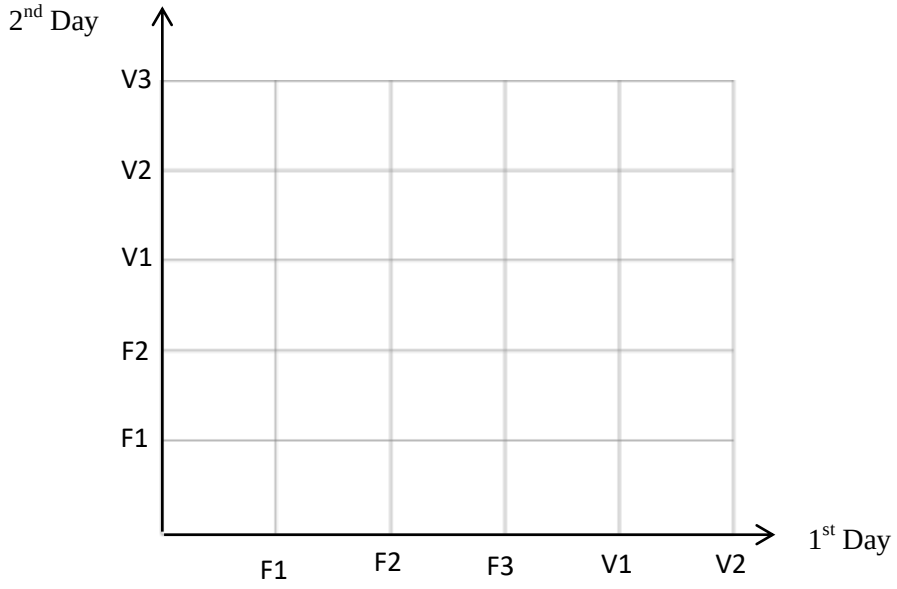
iii) Express the number of days which sold more than 25 kg of rice as percentage of total number of days.

iv) Draw the frequency polygon on the histogram.

10

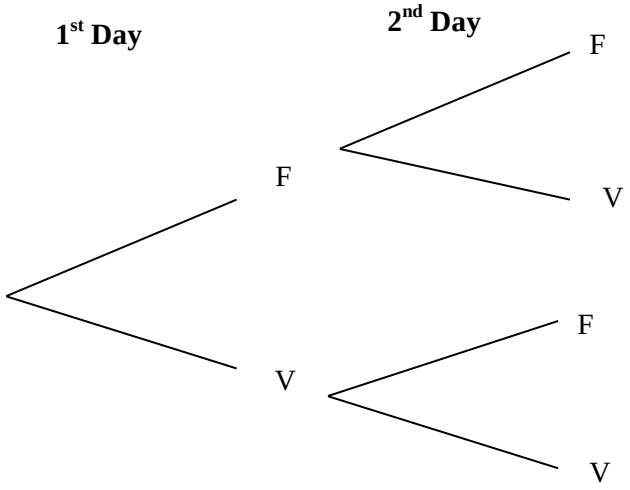
5. 5 Students who come to a restaurant bought 3 parcels of fish meals (F) and 2 parcels of Vegetable meals (V) on the 1st day. on the 2nd day they bought 2 parcels of fish meals and 3 parcel of vegetable meals.

i) Using the symbol " × " mark the sample space of a two parcels of meal bought by a student randomly the given grid.



ii) Indicate the event that random selected student who bought same types of meal on the 2 days on the sample space and find its probability.

iii) The following incompleted diagram is represents the meal bought by 5 student in the two days as shown below.



a) Complete the tree of diagram by indicating all the relevant probability.

b) Find the probability of student who bought parcel of fish meal at least once.

* * *

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சபரகமுவ மாகாண கல்வித் திணைக்களம்
Sabaragamuwa Provincial Department of Education

අධ්‍යයන පොදු සහතික පත්‍ර (සාමාන්‍ය පෙළ) පෙරහුරු පරීක්ෂණය, 2020
General Certificate of Education (Ord. Level) Pre Test, 2020

ගණිතය **II**
கணிதம் **II**
Mathematics II

පැය තුනයි
மூன்று மணித்தியாலம்
Three hours

Important:

- *Answer **ten** questions selecting **five** questions from **Part A** and **five** questions from **Part B**.*
- *Write the **relevant steps** and the **correct units** in answering the questions.*
- *Each question carries **10** marks.*

∗ *The volume of a right circular cylinder of radius $\boldsymbol{r}$ and height $\boldsymbol{h}$ is $\boldsymbol{\pi r^2 h}$.*

Part A

*Answer **five** questions only.*

1. An incomplete table of values prepared to draw a graph of a quadratic function is given below.

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

i. By considering the symmetry of the quadratic function obtain the value suitable for the blank.

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 on a graph paper.

iii. Write down the interval of values of x on which the function is increasing positively.

iv. Suppose that the function of the graph is written in the form $y = -(x - p)^2 + q$. Indicate the point (p, q) on the graph as A.

v. Using the graph, find the positive root of x such that $-x^2 + 4x = 0$ to the first decimal place.

[see page two

2. The information regarding the number of lottery sales within a 30 days month collected by a lottery seller is given below.

No of lotteries	150-250	250-350	350-450	450-550	550-650	650-750	750-850
No of days	3	2	5	9	3	6	2

i. Write down the modal class of the distribution.
ii. By taking the mid value of the modal class as the assumed mean or otherwise, find the mean number of lottery sold within a day to the nearest whole number.
iii. The seller gets a commission of 3 rupees per lottery he sells. If the seller sells a lottery tickets for 20 rupees. find the total commission he receives in a day
iv. 10% of the remaining amount is received by the lottery distributor, after paying the commission to the lottery seller. Accordingly show that the lottery distributor earns more than 26 000 rupees within a month by the lottery sales of this lottery seller.

3. Nimesh bought a television set worth 180 000 rupees by paying the half of the value as the down payment and agreed to pay the rest in 10 equal monthly installments at 20% annual interest rate where the interest is calculated on the racing loan balance.

" If Nimesh has 110 000 rupees with him, he will be able to pay two monthly installments and the down payments."

State with reasons and appropriate calculations whether this statement is true.

4. (a) Ashen has 100 rupees out of 5 rupee coins and 10 rupee coins. The number of 5 rupee coins is twice the number of 10 rupee coins.

taking the number of 5 rupee coins as x and the number of 10 rupee coins as y construct a pair of simultaneous equations in x and y.

Solve the pair of simultaneous equations and find separately the number of 5 rupee coins and 10 rupee coins.

(b) Solve the inequality $45p + 750 \geq 1100$ and find the minimum integral value that p can take.

5. a) The length breadth and height of a water tank in a pumping station are $5m, 3\,m, 2\,m$ respectively.

i. Calculate the volume of water required to fill the tank completely.
ii. The tank discharges water in to an empty cylindrical tank with a cross-sectional area of $3.2\ m^2$. If the cylindrical tank fills to a height of $3\ m$ in 40 minutes, show that the water flows at the rate of 240 liters per minute.

b) Using the logarithms table, find the value of $\frac{\sqrt[3]{56.5}}{0.56}$

[see page three

6. The length of a rectangle is $6\,cm$ and the breadth is $2\,cm$. A new rectangle is formed by reducing $x\,cm$ from the length and adding $x\,cm$ to the breadth of this rectangle. If the area of the new rectangle is $13\ cm^2$. show that $x^2 - 4x - 2 = 0$ and by solving the quadratic equation find the value of x correct to the first decimal place.

(Take the value of $\sqrt{6}$ as $2 \cdot 44$)

[see page four

Part B

Answer five questions only.

7. A private computer training institute is conducts 15 days of computer training course including theory and practical training. The practical training is conduct 75 minutes on the first day and 15 minutes more than the previous day on the days.

i) Kumara is a trainee who completed the computer course; Find the how many hours did he spend on the last day of practical training.

ii) If the number of days the course was held is n, show that the total time of practical training in n days is $\frac{n}{2}(135 + 15n)$ minutes.

iii) Find the total time he received practical during the course in hours.

iv) If Rs. 200 per hour was charged for practical training, Find the total amount that Kumara has to pay for practical training ?

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 PQR such that PQ = QR = 7.5 cm and $P\hat{Q}R = 90^0$

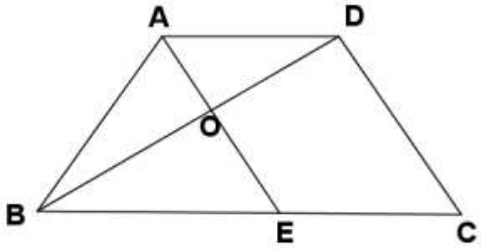
ii) Construct the perpendicular bisector of PQ and named the interesting point of PQ and PR as X and Y respectively.

iii) Construct the circle with PQ as diameter.

iv) The perpendicular bisector of PQ intersects the circle at Z , complete PZQR quadrilateral and write a special name of that quadrilateral.

v) Show that QR = 2XY

9. In the trapezium ABCD given in the figure, AB // BC. E is the midpoint of BC. BC = 2AD and the lines AE and BD intersect at O



i) Prove that BO = OD.

ii) Show that the quadrilateral OECD is a trapezium.

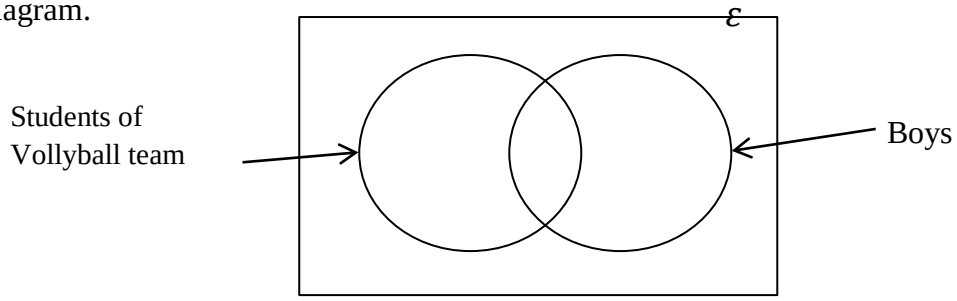
iii)Name a triangle which is equal to the area of the triangle ABD, giving reasons.

10. A solid metal cylinder and metal cone with radius of the base is r and height is twice of its radius. Melted both cylinder and cone, made 26 solid metal spheres without wasting metal. Show that the total volume of metal of the sphere and cone is $\frac{8\pi r^3}{3}$, hence Show that $a = \frac{r}{2}$.

[see page five

11. The sports unit of Jayasumana maha vidyalaya called up the boys and girls squad to select the school the school volleyball and cricket. 36 boys are selected to the team and 20 of them are selected to the volleyball team. 46 students are selected to the volleyball team. The number girls are selected to the cricket is exactly half the boys who selected to the squad.

i) Copy the given Venn diagram in your answer script and include above information in diagram.



ii) Shade the regions which represent the girls who are selected to the volleyball.

iii) Find the total number of students who are selected to the school team.

iv) Show that the boys of volleyball team is 25% of students who are selected to the school team.

12. PQ is a diameter of the circle with centre of O. R is the point on the circle and $\hat{QPR} = 30^0$. The bisector of $\hat{PQR}$ is intersect the circle at S. Show that $\hat{SPQ}$ is bisected by PR and prove that QRSO is a parallelogram.

* * *