



Grade : 10 **Year End Test - 2019** **32 E I**

Mathematics **Time : Two Hours**

Name / Index no.

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 Invigilator's Signature

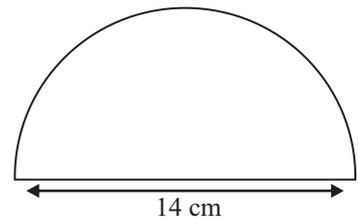
Important	Fox examiner's Use only		
	Question number	Marks	
<ul style="list-style-type: none"> The question paper contains 8 pages. Answer all questions on the paper it self Use the space provided under each question for working and writing the answer. It is necessary to write relevant steps and correct units Part A Each question carries 2 marks Part B Each question carries 10 marks 	Part A	1-25	
	Part B	1	
		2	
		3	
		4	
		5	
	Total		
	..... Marked by		..... Code number
	..... Checked by		..... Code number
	..... EMF		..... Code number
..... Chief Examiner		..... Code number	

Part A

Answer all questions on the paper it self.

01. The annual assessed value of a building is Rs. 80 000. The local authority charges 6% of the annual value as rates. Find the amount that should be paid as rates for a year.

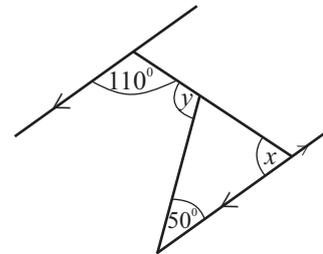
02. Find the arc length of the semi circle.



03. Solve : $3(x-2) + 1 = 9$

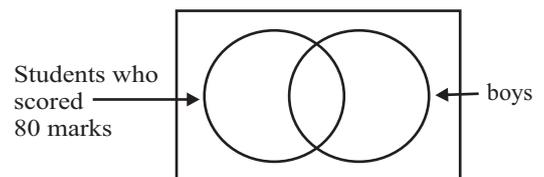
04. Find the value of $\log_5 1$.

05. Find the values of x and y in the figure.

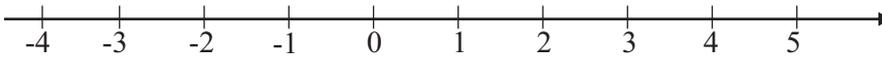


06. Find the least common multiple of $3m^2$, $8m^2n$ and $6mn^2$.

07. Following is a venn diagram drawn to denote information about mathematics marks of students of a class. Shade the region of girls who scored 80 marks.

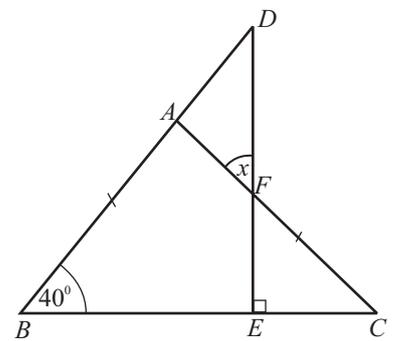


08. $x - 5 < -2$. Solve the inequality and represent the solution on the number line

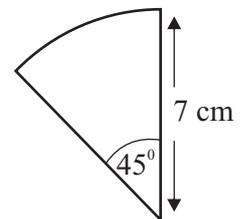


09. Amila gave $\frac{2}{5}$ of the amount he had to his wife and divided the rest equally among his three daughters. Find the fraction of the amount a daughter received.

10. $AB = AC$ and $\hat{FEC} = 90^\circ$ in the figure. Find the value of \hat{AFD} .



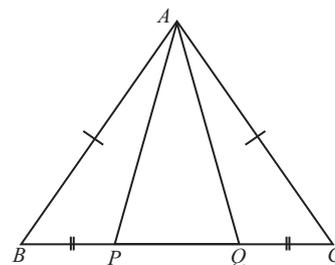
11. Find the area of the sector.



12. A and B are two mutually exclusive events of the sample space S . $P(A) = 0.4$ and $P(A \cup B) = 0.77$. Find $P(B)$.

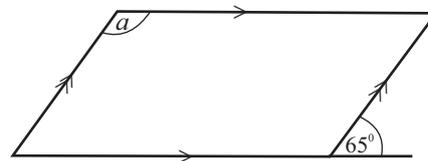
13. The square root of a number to the nearest first approximation is 4.8. Find the number.

14. $AB = AC$ and $BP = CQ$ in the figure. Name two pairs of congruent triangles.



15. Simplify: $\frac{3}{x} - \frac{1}{2x}$

16. Find the value of a according to the information given in the figure.



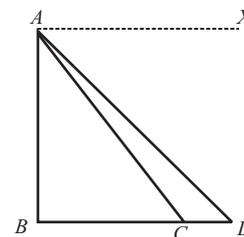
17. Fill in the blanks of the following expression.

$$(2a + \dots)^2 = 4a^2 + \dots + 9$$

18. In the figure, AB is a vertical post. B, C and D are three points on the horizontal ground. Name,

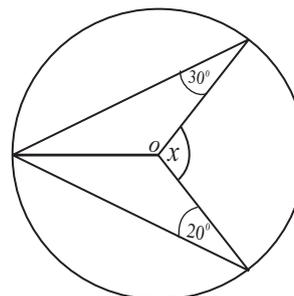
i. The angle of elevation of A from C .

ii. The angle of depression of D from A .



19. Evaluate using factors: $\frac{22}{7} \times 20 - \frac{22}{7} \times 6$.

20. O is the centre of the circle. Find the value of x .

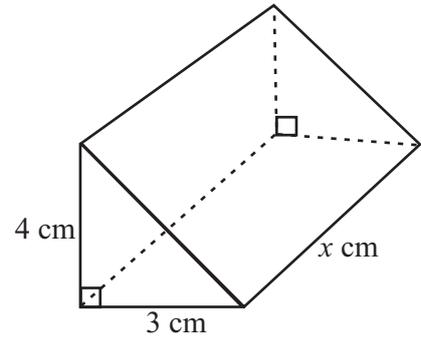


21. Underline the discrete data from the following.
- The weight of vegetables brought to a shop in 10 days.
 - The number of members of 40 families in a housing scheme.
 - The data collected about weights and heights of grade 10 students.

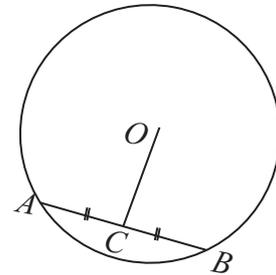
22. Put \checkmark in front of the features that are common to both square and rectangle and put \times in front of features which are not common to both square and rectangle.

Angles at vertices are right angles.	
Diagonals bisect each other perpendicularly.	
Diagonal are equal in length.	

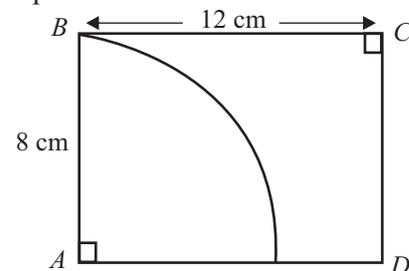
23. The volume of the prism is 36 cm^3 . Find the value of x .



24. O is the centre of the following circle. C is the mid point of AB . $OC = 5 \text{ cm}$ and the radius of the circle is 13 cm . Find the length of the chord AB .



25. $ABCD$ is a rectangle. Sketch in the diagram, the location of the point P equal distance from AB and AD and 8 cm from A .



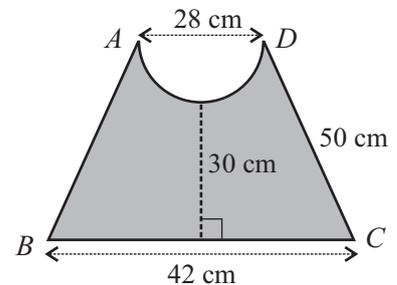
Part B

Answer all questions on the paper it self.

- (01) $\frac{2}{5}$ of an imported stock of wheat flour was sent to southern province and $\frac{1}{4}$ of the remainder was sent to western province
- What fraction of the imported stock was remaining after sending flour to southern province.
 - Find the fraction of the stock that was sent to the western province.
 - $\frac{4}{9}$ of the remainder after sending wheat flour to both the provinces was stored. Express the fraction of wheat flour that was stored as a fraction of the stock imported.
 - The remaining mass of flour after storing was 24000 t. Find the total mass of wheat flour that was imported.

(02) The figure shows a sketch of a symmetric wall decoration.

- What is the radius of the semi circular part?
- Find the area of the semi circular part.



- Find the area of the shaded portion of the wall decoration.
- A semi circular part is cut and removed from the wall decoration such that BC is a diameter of it. Then a ribbon is fixed around the remaining part of the wall decoration. Find the length of the ribbon needed for that.

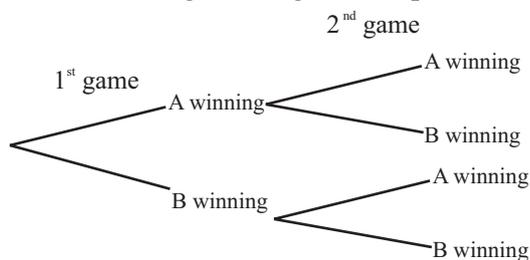
- (03) a) 20 men take 45 days to construct a building.
 i. What is the magnitude of the task of constructing the building in man days?

After working for 30 days, construction had to be stopped due to bad weather.

- ii. Find the magnitude of the task remained at the end of the 30th day.
- iii. To finish the work on the scheduled date, find the additional number of workers that should be recruited.
- b) Sandun deposited Rs. 60 000 at 15% annual simple interest rate. Find the total amount that he will receive at the end of the third year.

- (04) a) A and B are two players competing in a table tennis match. The probabilities of player A winning the first and the second sets are $\frac{3}{5}$ and $\frac{1}{3}$ respectively. A set does not ends with a draw.

- i. Find the probabilities of player B winning the first and the second sets.
- ii. Complete the following tree diagram to represent above probabilities.



- iii. Using the tree diagram, find the probability of two players winning one set each.

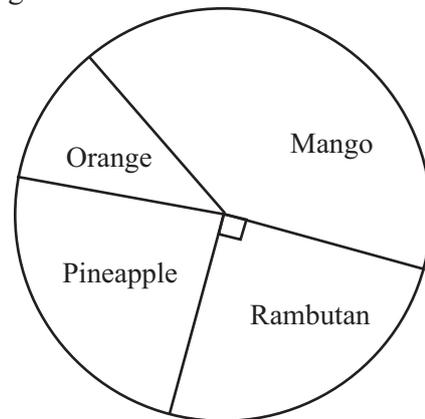
- b) The following grid represents the probabilities of tossing a fair coin twice. Enclose on the grid, the event of getting the same outcome both times and find its probability.

Second Toss	T	X	X
	H	X	X
		H	T
		First Toss	

(05) The following pie chart is drawn to represent the favorite fruits of a group of students.

- i. The ratio of students who prefer orange, pineapple and mango is 1:3:5. Fill in the blanks of the following table.

Fruit	Angle of the sector
Orange	
Pineapple	
Mango	



- ii. What is the fruit most number of students prefer?
- iii. If the number of students who prefer Rambutan is 9, find the number of students who prefer orange.
- iv. Express the number of students who prefer pineapple as a percentage of the total number of students in the group

Important :

- Answer ten questions selecting five questions from part A and five questions from part B.
- Each question carries 10 marks
- The volume of a right circular solid cylinder of base radius r and perpendicular height h is $\pi r^2 h$.

Part A
Answer five questions only.

01. Given below is an incomplete table of values prepared to draw the graph of the function $y = -2x^2 + 5$.

x	-3	-2	-1	0	1	2	3
y	-13	-3	.....	5	3	.....	-13

- Find in the values of y when $x = -1$ and $x = 2$.
- Draw the graph of the function taking 10 small squares along x axis as one unit and five small squares along y axis as one unit.
 Using your graph,
- Write the interval of values of x which the function is positive and increasing.
- Find the roots of the equation $2x^2 - 5 = 0$.
- Describe how the above graph should be displaced to obtain the graph of the function $y = -2x^2 + 1$.

02. Amila who is engaged in a ready made garment business, earned Rs. 1 200 000 in the last year. The following table shows how the government charges income tax from individuals.

Annual income	Tax percentage
First Rs. 500 000	Free from Tax
Next Rs. 500 000	4%
Next Rs. 500 000	8%

- Find his taxable income.
- Find the total amount that he should pay as the annual income tax.
- Express the total amount paid as the income tax as a percentage of his annual income.
- He spent $\frac{1}{5}$ of the income remained after paying the income tax, to repair his vehicle. Find the amount that he spent to repair the vehicle.

03. In a fruit drink stall, during the first hour of the morning, income received by selling 6 glasses of orange juice and 5 glasses of mango juice was Rs. 650. In the second hour, the income received by selling three glasses of orange juice and three glasses of mango juice was Rs. 360.

- Using simultaneous equations, find separately the price of a glass of an orange juice and the price of a glass of a mango juice.
- In the third hour, the income received by selling n number of glass of orange juice is greater than the income received by selling mango juice in the first two hours. Buildup an inequality of n and find the minimum possible value of n by solving it.

04. Kamal is employed in japan. The table below shows the durations of telephone calls he took to his family members in a month of 30 days.

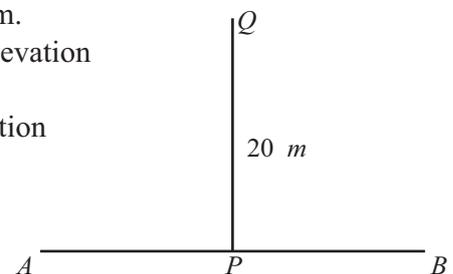
Time interval (minutes)	Mid value (x)	Deviation (d)	No. of days (f)	fd
12 - 16	14		5	
26 - 20			2	
20 - 24			6	
24 - 28		0	10	
28 - 32			4	
32 - 36		8	3	

- Copy down the table and fill in the blanks of.
- Find the mean call duration.
- If the call charge is Rs. 14 per minute, find the daily cost for calls.

05. a.) Solve: $\frac{6}{x+4} - \frac{10}{3(x+4)} = \frac{2}{9}$

- The length of a rectangle is 4 cm greater than its breadth. The area of the rectangle is 96 cm^2 .
 - Construct a quadratic equation taking the breadth of the rectangle as x .
 - Solve the quadratic equation and find the length and the breadth of the rectangle.

06. a.) The height of the vertical post PQ on the horizontal ground is 20 m. A and B are two points on the horizontal ground. The angle of elevation of Q from A is 42° . The angle of depression of B from Q is 27° . Draw a 1 : 200 scale diagram to represent the above information and find the actual distance between the points A and B .



- A train maintained an average speed of 40 kmh^{-1} during the first three hours of a journey and an average speed of 20 kmh^{-1} during the next five hours of the journey. Find the average speed of the train in the whole journey.

Part - B

• *Answer five questions only.*

07. A passenger liner was anchored two miles away from a harbour due to a technical fault. To bring the passenger to the harbour, first time 30 boats, second time 28 boats, third time 26 boats were used in such a way, that the number of boats used in each time is two less than the previous time.
- In which kind of a progression the number of boats used in the first, second and third times lie?
 - Find the number of boats used in the 10th time.
 - All the passengers were brought to the harbour at the end of the 10th time. If one boat carried 10 passengers, an officer of the ship told that, the total number of passengers that there were in the ship was 2000. State with reasons whether his statement is correct.
08. Using a straight edge with cm/mm scale and a pair of compasses only,
- Construct the triangle ABC in which $AB = 5$ cm, $\hat{A}BC = 90^\circ$ and $BC = 7$ cm.
 - Construct the locus of points equal distance from B and C and name the point of intersection of the locus and AC as O .
 - Construct a circle taking O as the centre and OC as the radius.
 - Measure and write the diameter of the circle.
 - Using the above diameter, find the value of $\sqrt{74}$ to the nearest first decimal place.
09. $AB = AC$ in the isosceles triangle ABC . The line PS , drawn parallel to BC intersects the sides AB and AC at Q and R respectively. $\hat{PBQ} = \hat{SCR}$. Draw a diagram to represent above information and prove that the triangles PBQ and RCS are congruent.
10. A right circular solid cylinder of base radius 6 cm and perpendicular height 35 cm was melted and 11 identical prisms of cross sectional area 8.73 cm^2 and length h were made. There was no wastage of metal in the process. show that $h = \frac{360}{8.73}$, and using logarithms, find the value of h to the nearest first decimal place.
- $$\left(\pi = \frac{22}{7}\right)$$

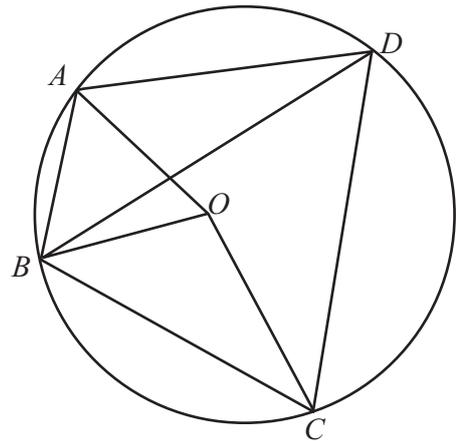
11. A, B, C and D are four points on a circle of centre O . BD is the bisector of \widehat{ADC} . Copy the diagram into your answer script and,

i. Show that $\widehat{AOB} = \widehat{BOC}$.

ii. Write the theorem that you used in part (i) above.

iii. Prove that $AB = BC$.

iv. Find the value of \widehat{OCB} , if $\widehat{BDC} = 70^\circ$.



12. The following information is revealed from a survey done on a group of tourists about two places that they have visited.

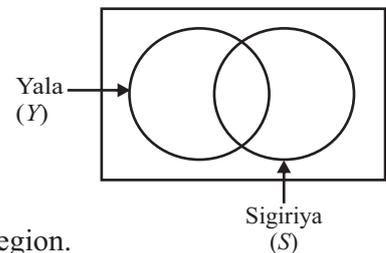
- ◆ The number of tourists who have been to Yala only is 75.
- ◆ The number of tourists who have been to both Yala and Sigiriya is 120.
- ◆ The number of tourists who have not been to any of these two places is 36.

i. Copy the Venn diagram and include the above information in it.

ii. Shade in the Venn diagram the region of the tourists who have been to Sigiriya only.

iii. The number of tourists who have been to only one of the above two places is 110. Find the number of tourists belong to the shaded region.

iv. Find the number of tourists who have not been to Yala and express that in set notation.



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