MT 9201

First Terminal Evaluation 2017-18

MATHEMATICS

Std. : IX

Time : 2½ hours
Total Score : 80

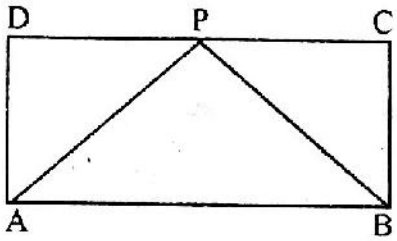
Instructions :

1. First 15 minutes is cool-off time. This time is to be used for read questions and plan the answers.
2. Give explanations if necessary.
3. Read each question and instructions carefully and write answer.
4. Answer only required number of questions from each section.

PART - 1

(Answer all questions. Each question carries 1 mark)

1. Area of rectangle ABCD in the figure is 36 square centimetres. What is the area of triangle ABP ?



2. Which of the following fractions is equal to $\frac{3}{8}$?

$\frac{4}{9}$, $\frac{21}{56}$, $\frac{27}{81}$, $\frac{9}{64}$

PART - 2

(Answer any five questions. Each question carries 2 marks)

3. Write two fractions greater than $\frac{5}{8}$ and less than $\frac{6}{7}$

4. How much is the length of one side of a square of area 3 square metres ? Find it's perimetre.

5. Calculate the value of $\sqrt{243} + \sqrt{300}$ = _____

6. Sonu bought new bag and chappals. She paid 1250 rupees. The price of the bag is 600 rupees more than the price of chappals. Calculate the price of bag and chappal?

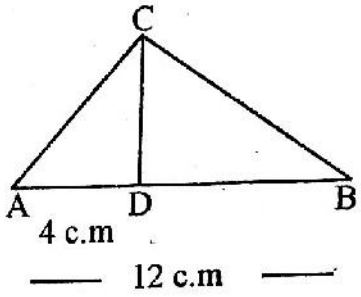
7. Write the decimal form of the following fractions.

(a) $\frac{3}{25}$ (b) $\frac{1}{8}$

8. In the figure AB = 12 c.m, AD = 4 c.m. Then

(a) BD = _____ c.m.

(b) The ratio of the areas of triangle ADC and triangle BDC is = _____



PART - 3

(Answer any 5 questions. Each question carries 3 marks)

9. We can write $\frac{1}{2} = \frac{1}{3} + \frac{1}{6}$ and

$$\frac{1}{3} = \frac{1}{4} + \frac{1}{12}$$

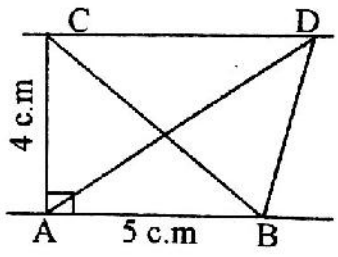
Similarly write fractions $\frac{1}{4}$, $\frac{1}{5}$ and $\frac{1}{6}$ as the sum of two unit fractions (fractions with numerator 1)

10. In the figure line AB is parallel to CD.

If AB = 5 cm, AC = 4 cm and $\angle CAB = 90^0$

(a) Calculate the area of triangle ABC.

(b) How much is the area of triangle ABD? Write reason.



11. Draw triangle having sides 5 c.m, 6 c.m and 7 c.m. Draw an isosceles triangle of the same area and having one side 7 c.m.

12. The difference between two numbers is 3. The difference between their squares is 54. Find the numbers.

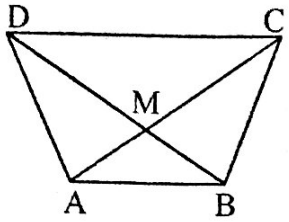
13. Minnu bought 8 notebooks of the same price and a pen from the school store and paid 223 rupees. Chinnu bought 10 notebooks of the same kind and a pen. She paid 275 rupees. Find the cost of one notebook.

14. Draw a square of area 13 square centimetres.

15. In the figure ABCD is a trapezium. Diagonal AC and BD intersect at M. Area of triangle ABC is 24 cm² and area of triangle AMB is 10cm².

(a) Find the area of triangle BMC.

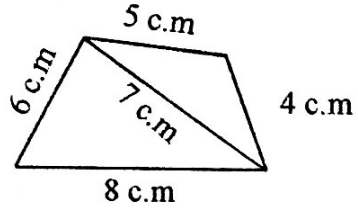
(b) How much is the area of triangle AMD ? Write reason.



PART - 4

(Answer any 7 questions. Each question carries 4 marks)

16. Draw the quadrilateral with given measures. Draw a triangle of the same area as that of the quadrilateral.



17. Look at the pattern.

$$\frac{2}{3} - \frac{1}{2} = \frac{4-3}{3\times 2} = \frac{1}{3\times 2}$$

$$\frac{3}{4} - \frac{2}{3} = \frac{9-8}{4\times 3} = \frac{1}{4\times 3}$$

$$\frac{4}{5} - \frac{3}{4} = \frac{16-15}{5\times 4} = \frac{1}{5\times 4}$$

(a) Write next two lines.

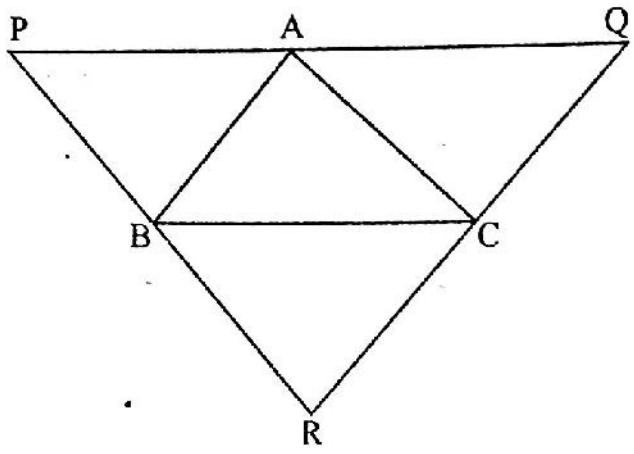
(b) If 'n' is a natural number. Prove that $\frac{n}{n+1} - \frac{n-1}{n} = \frac{1}{n(n+1)}$

18. Three times a number and five times another number added together make 169. When five times the first number and three times the second number added together make 159.

(a) Write the given facts as two equations.

(b) Find the numbers.

19. In the picture below, the lines parallel to each side of triangle ABC through the opposite vertex are drawn to make the triangle PQR.



(a) Draw this picture. Draw the lines BQ, CP and AR.

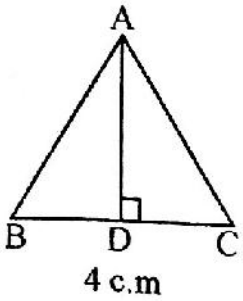
(b) The triangles ABP, AQC and BRC have the same area as that of triangle ABC. Why ?

(c) Find another 4 triangles of same area as that of triangle ABC from the picture which you have drawn and write their names.

20. Triangle ABC is an equilateral triangle. BC = 4 c.m. AD is perpendicular to BC.

(a) Find the length of AD.

(b) Calculate the perimeter and area of square drawn with AD as side.



21. (a) Draw the square ABCD of area 9 square centimetres.

(b) Draw the diagonal AC of the square. Draw a square with AC as side.

(c) How much is the area of this new square ? Calculate it's perimeter also.

22. A page from Ananthu's Maths notebook is given below.

$$\frac{1}{3} = \frac{1}{10} \times \frac{10}{3}$$

$$= \frac{1}{10}\left[3 + \frac{1}{3}\right]$$

$$= \frac{3}{10} + \frac{1}{30}$$

$$= \frac{3}{10} + \frac{1}{100} \times \frac{100}{30}$$

$$= \frac{3}{10} + \frac{1}{100}\left[3 + \frac{10}{30}\right]$$

$$= \frac{3}{10} + \frac{3}{100} + \frac{1}{300}$$

$$= \frac{3}{10} + \frac{3}{100} + \frac{1}{1000} \times \frac{1000}{300}$$

$$= \frac{3}{10} + \frac{3}{100} + \frac{1}{1000}\left[3 + \frac{100}{300}\right]$$

$$= \frac{3}{10} + \frac{3}{100} + \frac{3}{1000} + \frac{1}{3000}$$

The fractions $\frac{3}{10}$, $\frac{33}{100}$, $\frac{333}{1000}$ ... get closer and closer to $\frac{1}{3}$

Like this find a line of fractions getting closer to $\frac{1}{6}$ and denominators powers of 10.

23. The hypotenuse of a right angled triangle is 1½ metre and another side is ½ metre. Calculate its perimeter correct to centimetres.

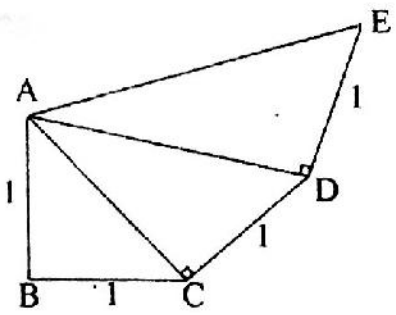
24. Given below is a figure drawn by Ammu in a chart paper.

AB = BC = CD = DE = 1 Unit

$\angle ABC = \angle ACD = \angle ADE = 90^0$

(a) Calculate the lengths of AC, AD and AE.

(b) Calculate the perimeter and area of this shape (ABCDE).



PART - 5

(Answer any 5 questions. Each question carries 5 marks)

25. Draw a regular pentagon having side 4 centimetre and draw a triangle of the same area.

26. (a) Write a pair of fractions having sum 1.

(b) Write their reciprocals.

(c) Find the sum and product of the reciprocals. Check whether they are equal.

(d) Is it applicable to all such fractions ? Justify your answer using algebra.

27. The hypotenuse of a right angled triangle is 29 cm long. It's area is 210 square centimetres. Calculate the lengths of perpendicular sides.

28. If the length of a rectangle is increased by 2 metres and breadth decreased by 1 metre the area would decrease by 4 square metres. If the length is decreased by 3 metres and breadth increased by 3 metres, the area would increase by 9 square metres.

(a) If the length is x and breadth is y, write two equations.

(b) Find the length and breadth.

29. In triangle ABC, BC = 10 centimetre, $\angle B = 105^0$, $\angle C = 30^0$

(a) Draw a rough figure of triangle ABC. Draw perpendicular BD from B to the side AC.

(b) Find the measures of angles of triangles ABD and BCD.

(c) Calculate the lengths of BD, CD and AB.

(d) Find the area of triangle ABC.

30. When 1 is subtracted from the numerator of a fraction and on simplification, we get $\frac{2}{3}$. When 5 is added to the denominator and on simplification, we get $\frac{1}{2}$. Find the fraction.

31. In triangle ABC, AM is the bisector of angle BAC. MP is drawn perpendicular to AB and MQ is perpendicular to AC.

(a) Prove that MP and MQ are of the same length.

(b) Prove that, in any triangle, the bisector of an angle divides the opposite side in the ratio of the sides of the angle.