SAMAGRA SHIKSHA, KERALA
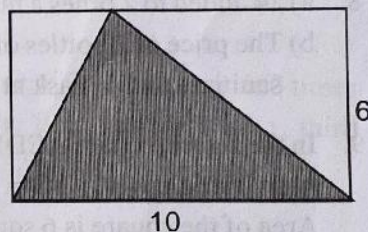## FIRST TERMINAL EVALUATION - 2022-23
MATHEMATICS

Standard: IX

Time : $2\frac{1}{2}$ Hours

Score : 80

Instructions

- Read the instructions before answering the questions
- Give explanations wherever necessary
- First 15 minutes time is cool – off time.
- Need not simplify the answer by using value of $\sqrt{2}, \sqrt{3}, \pi$ ... unless it is specifically asked.

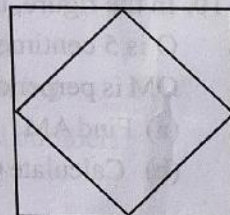**Answer any 3 Questions from 1 to 4. Each question carries 2 scores.**   **(3 x 2 = 6)**

1. In the figure, the sides of the rectangle are 10 centimetres and 6 centimetres.
   (a) What is the area of the rectangle?
   (b) Find the area of the shaded region.

   6

   10

2. (a) Which of the fractions given below is equal to $\frac{13}{25}$?
 $$\left(\frac{13}{50}, \frac{13}{100}, \frac{52}{100}, \frac{52}{125} \right)$$
   (b) Write the decimal form of $\frac{13}{25}$.

3. Sum of two numbers is 36 and their difference is 4. Find the large number.

4. In the figure, small square is drawn by joining the midpoints of the sides of the large square. Area of the large square is 10 square centimetres.
   a) Find the area of the small square.
   b) What is the length of a side of the small square?

Answer any 4 Questions from 5 to 10. Each question carries 3 scores.   **(4 x 3 = 12)**

5. In the figure PQ and CB are parallel.
   (a) Write a triangle whose area equal to the area of the triangle PQB.
   (b) Write two more pairs of triangles with equal area.

   C
   B
   R
   P
   Q
   A
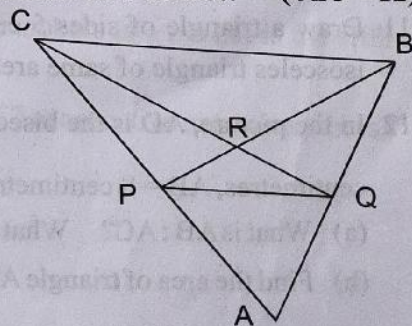
6. In the figure, BP = 3 centimetres, PQ = 4 centimetres, QC = 5 centimetres and area of the triangle ABC is 120 square centimetres.

(a) What is the ratio of areas of triangle ABP, triangle APQ and triangle AQC?

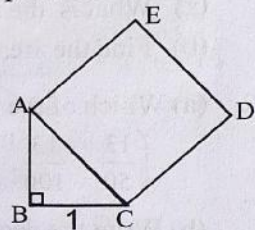(b) Find the area of triangle ABP.

(c) Calculate the area of triangle APC.
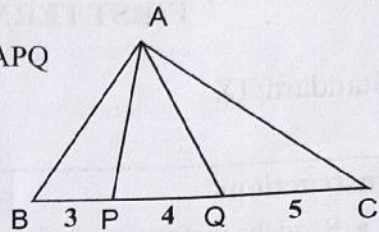
7. a) Which of the fractions given below is equal to 0.444...?

$$\left(\frac{2}{3}, \quad \frac{4}{3}, \quad \frac{2}{9}, \quad \frac{4}{9} \right)$$

b) Calculate $\sqrt{0.444...}$ in decimal form.

8. a) 24 added to 2 times a number gives 74. Find the number.

b) The price of 2 bottles of sanitizer and 3 mask is 74 rupees. The price of 2 bottles of sanitizer and 5 mask at the same rate is is 94 rupees. Find the price of one mask.

9. In the figure, square ACDE is drawn on the hypotenuse of right triangle ABC. BC = 1 centimetre, $\angle B = 90°$. Area of the square is 6 square centimetres.

(a) Find the length of one side of the square.

(b) Find the perimeter of triangle ABC.

10. In the figure, the radius of the circle centred at O is 5 centimetres. AB = 8 centimetres. OM is perpendicular to AB.
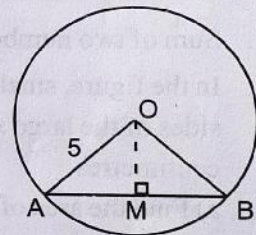

(a) Find AM

(b) Calculate OM

Answer any 8 Questions from 11 to 21. Each question carries 4 scores. (8 x 4 = 32)

11. Draw a triangle of sides 5 centimetres, 6 centimetres, and 7 centimetres. Draw an isosceles triangle of same area.

12. In the picture, AD is the bisector of angle BAC. Area of triangle ABC is 180 square centimetres, AB = 8 centimetres and AC = 10 centimetres.

(a) What is AB : AC? What is BD : DC?

(b) Find the area of triangle ABD.
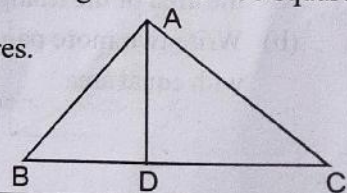
13. (a) Write three fractions getting closer and closer to $\frac{1}{3}$ and denominators as power of 10.

   (b) Write the decimal form of $\frac{1}{3}$.

14. Write the missing numbers

Sum	Fractions with denominators as power of 10	Decimal form
$\frac{1}{2} + \frac{1}{5^2}$	$\frac{5}{10} + \frac{4}{100}$	....
$\frac{1}{2} + \frac{1}{5^2} + \frac{1}{2^3}$	$\frac{5}{10} + \frac{4}{100} + \frac{125}{1000}$	....
$\frac{1}{2} + \frac{1}{5^2} + \frac{1}{2^3} + \frac{1}{5^4}$	....	....

15. Swathi went to a bank to withdraw ₹5000. She asked the Cashier to give her 100 rupee notes and 200 rupee notes only. She got 35 notes in all. Find how many notes of 100 rupee and 200 rupee she received?

16. The price of 3 kilogram orange and 2 kilogram apple is 400 rupees; and for 2 kilogram orange and 3 kilogram apple is 450 rupees.
   Find the price of one kilogram orange and price of one kilogram apple.

17. a) Write a two digit number whose sum of digits is 11.

   b) The sum of the digits of a two digit number is 11. The number got by interchanging the digits is 27 less than the original number. What is the number?.

18. a) In triangle ABC, AB = 2 centimetres, BC = 3 centimetres, $\angle B = 90°$. find the length of AC.
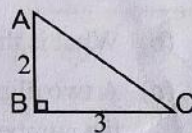
   b) Draw a square of area 13 square centimetres.

19. We know that $\sqrt{3} \approx 1.73$, $\sqrt{6} \approx 2.44$

   (a) Write a natural number larger than $\sqrt{3}$ and less than $\sqrt{6}$

   (b) Write three fractions larger than $\sqrt{3}$ and less than $\sqrt{6}$.

20. a) $(x + y)(x - y) = x^2 - $ ....

   b) Find $(\sqrt{2} + 1)(\sqrt{2} - 1)$.

   c) Use this to compute $\frac{1}{\sqrt{2} + 1}$ correct to two decimal places. [$\sqrt{2} \approx 1.414$]

21. Draw an equilateral triangle of side 6 centimetres. Divide it into three triangles of equal area.

Answer any 6 Questions from 22 to 29. Each question carries 5 scores. (6 x 5 = 30)

22. In quadrilateral ABCD, AB = 8.5 centimetres;
    BC = 4.5 centimetres; CD = 5 centimetres;
    AD = 6 centimetres; and BD = 7.5 centimetres.
   Draw the quadrilateral. Draw a triangle of same area.
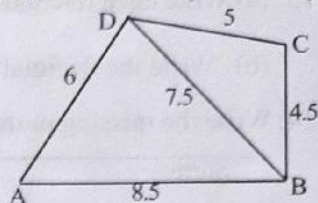
23. In triangle ABC, Q is the mid-point of BC and AP : PQ = 2 : 1.
    Area of triangle ABC is 60 square centimetres.

    (a) What is the area of triangle ABQ?

    (b) Find the areas of triangle ABP and triangle BPQ.

    (c) What is the area of triangle BPC?
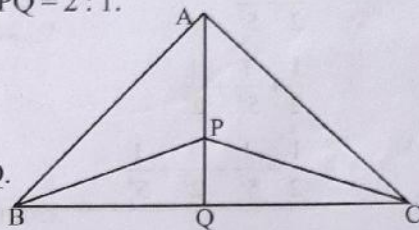


24 In the figure, diagonals of trapezium ABCD intersect at M. Areas of triangle AMD and
    triangle AMB are 10 square centimetres and 20 square centimetres respectively.

    (a) Find the area of triangle BMC

    (b) What is BM : MD?

   (c) Find the areas of triangle CMD and trapezium ABCD
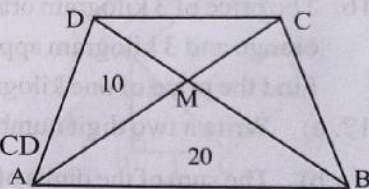
25. (a) Write $\frac{1}{8}$ in decimal form.

    (b) What is the decimal form of $\frac{5}{8}$?,

    (c) A two digit number is divided by another two digit number gives 3.625. What are
         the numbers?

26. There are two squares. One side of the larger square is 5 centimetres more than the
     smaller. Difference between their areas is 55 square centimetres. Find the sides of
     each square.

27. In the figure, sides of the rectangle are $\sqrt{8}$ centimetres and $\sqrt{2}$ centimetres.

    (a) Find its perimeter.

    (b) Find its area.

    (c) Find the length of its diagonal.
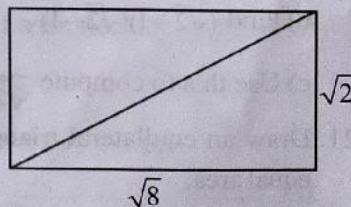
28. The square ADEF is drawn on the altitude of an equilateral triangle of sides 2 metres.

    (a) What is the length of DC?

    (b) Find the area of square ADEF.

    (c) What is the length of AD?

    (d) Find the area of triangle ABC.
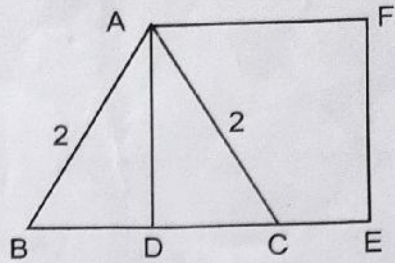
29. Read the given passage carefully and write answers to the following questions.

$$1 + 2 + 3 = 3 \times 2 = 6$$
$$2 + 3 + 4 = 3 \times 3 = 9$$
$$3 + 4 + 5 = 3 \times 4 = 12$$
$$4 + 5 + 6 = 3 \times 5 = 15$$

The sum of three consecutive natural numbers is a multiple of 3; and the sum is 3 times the middle number. If the middle number is x, then the first number is $x-1$, third number is $x+1$

$$\text{Sum} = (x-1) + x + (x+1) = 3x$$

What about the sum of 5 consecutive natural numbers?

$$1 + 2 + 3 + 4 + 5 = 5 \times 3 = 15$$
$$2 + 3 + 4 + 5 + 6 = 5 \times 4 = 20$$
$$3 + 4 + 5 + 6 + 7 = 5 \times 5 = 25$$

Sum is multiple of 5 and 5 times the middle number.

    (a) Sum of 3 consecutive natural numbers is 90. Find the middle number

    (b) Which of the numbers given can be sum of 3 consecutive natural numbers?

        (100, 200, 300, 400)

    (c) The sum of 5 consecutive natural numbers is 100. What is the middle number?

    (d) If the middle number of 5 consecutive natural numbers is x, What is the fifth number?

    (e) Which of the numbers given below can be sum of 7 consecutive natural numbers?

        (50, 60, 70, 80)

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