A

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FIRST TERMINAL EVALUATION 2024-2025
MATHEMATICS

Class : 9 **Time : $2\frac{1}{2}$ hours**

Score : 80

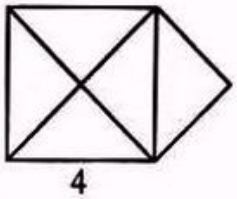
Instructions

- There is a 'cool off' time of 15 minutes in addition to the writing time. Use this time to get familiar with questions and plan your answers.
- Read the instructions carefully before answering the questions.
- Keep in mind, the score and time while answering the questions. Give explanations wherever necessary.
- No need to simplify irrationals like $\sqrt{2}, \sqrt{3}, \pi$ etc., using approximations unless you are asked to do so.

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

1. The price of a pen and a pencil is 24 rupees. The price of the pen and 2 pencils is 30 rupees. What is the price of a pencil? What is the price of a pen?

2. In the figure, the length of one side of the large square is 4 cm.



   a) What is the length of the diagonal of the small square?
   b) What is the area of the small square?

   $[2, 2\sqrt{2}, 4, 8]$

3. a) Write the decimal form of $\frac{3}{10}$.

   b) Which of the following is the fractional form of 0.003?

   $\left[\frac{3}{10}, \frac{3}{100}, \frac{3}{1000}, \frac{3}{10000}\right]$

4. For any two positive numbers x, y;

   $(x + 1)(y + 1) = xy + x + y + 1$.

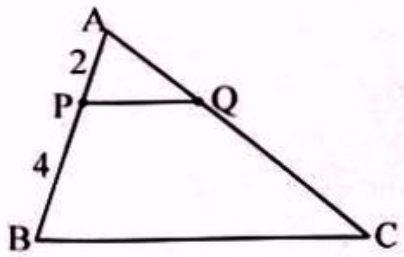
   The product of two natural numbers is 315 and their sum is 36. Using the above principle, find the product of the numbers next to each.

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

5. Draw a triangle of sides 5 centimetres, 6 centimetres and 8 centimetres. Draw a right triangle of the same area with one side 8 centimetres.

6. The sum of two numbers is 29 and their difference is 5. What are the numbers?

7. In the figure PQ, BC are parallel.
   AP = 2 centimetres.
   PB = 4 centimetres.
   AC = 9 centimetres.



   a) What is AP:AB?
   [1:2, 1:3, 2:1, 2:3]
   b) Calculate the length of AQ.

8. $\frac{1}{9} = 0.111...$
   a) What is the fractional form of $0.333... + 0.777...$
   $\left(\frac{10}{3}, \frac{4}{9}, \frac{7}{10}, \frac{10}{9}\right)$
   b) Write the fractional form of $\sqrt{0.444...}$

9. Draw a line of length 11 centimetres. Divide this line in the ratio 4:5.

10. a) Write the natural number equal to $\sqrt{12} \times \sqrt{27}$.
    [9, 12, 18, 27]
    b) $\sqrt{\frac{1}{12}} \times \sqrt{\frac{4}{27}} =$ .....

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

11. Any odd number can be written as the difference of two perfect squares.
    Example: $7 = 4^2 - 3^2$.
    Using the above idea,
    a) Write 13 as the difference of two perfect squares.
    b) Draw a square of area 13 square centimetres.

12. The sum of the ages of Rajan and his son Babu is 60 years. After 6 years, age of Rajan becomes 3 times the age of his son. What are the present ages of the father and his son?

13. Draw a rectangle of perimeter 18 centimetres and sides are in the ratio 4:3.

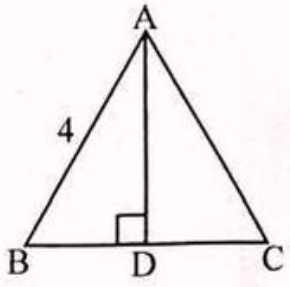
14. The general form of natural numbers which leaves remainder 1 on division by 5 is $5n + 1$, $n = 0, 1, 2, 3....$

a) What is the remainder when 36 is divided by 5?

b) Write the general form of natural numbers leaving remainder 2 on division by 5.

c) What is the remainder obtained on dividing the product of two natural numbers which leaves remainder 1 and 2 on division by 5?

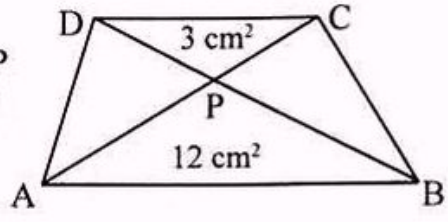
15. In the figure, length of a side of an equilateral triangle ABC is 4 metres. AD is perpendicular to BC.



a) Find the length of BD and AD.

b) Calculate the perimeter of the triangle ADB up to a centimetre.($\sqrt{3} \approx 1.732$)

16. The diagonals AC and BD of trapezium ABCD divide it in to four triangles. Area of triangle ABP is 12 square centimetres and area oftriangle DCP is 3 square centimetres.



a) Which triangle in the figure has area equal to the area of triangle APD?

b) What is the area of triangle APD?

c) Find the total area of the trapezium.

17. a) In a calender, three out of four numbers that falls in a square of a month are given below. Find the missing number.

2	3
.....	10

b) By taking the first number as x in the square, write the missing number.

x	$x+1$
$x+7$	.....

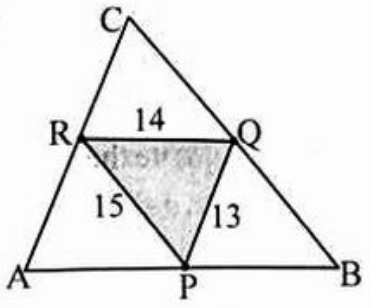
c) Find the difference of the diagonal products in the second table.

18. For any two positive numbers x, y;
$(x-1)(y-1) = xy - (x+y)+1$.

a) Find 29×49 using the above principle.

b) The product of two natural number is 112 and their sum is 23. Find the product of two natural numbers just before each.

19. In the figure, P, Q, R are the midpoints of AB, BC and AC of triangle ABC. PQ = 13 centimetres, QR=14 centimetres, PR=15 centimetres.



a) What is the length of AB?

[13, 14, 15, 28]

b) Find the perimeter of the triangle ABC.

c) If area of a triangle PQR is 84 square centimetres, what is the area of triangle ABC ?

20. The perimeter of a classroom in the shape of a rectangle is 34 metres. When a hall is made with 5 times the length and 3 times the breadth of the class room, perimeter is 142 metres. If the lengh of the classroom is x and breadth is y,

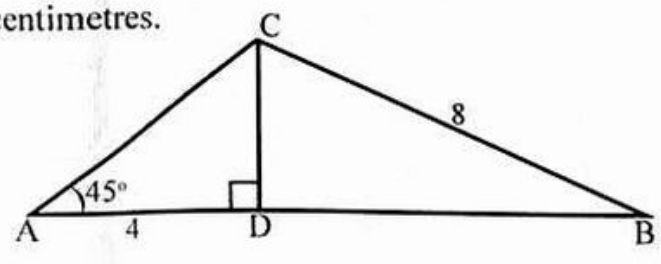
a) Write an equation to denote the sum of the length and breadth of the class room.

b) Write an equation to denote the sum of the length and breadth of the hall in terms of x and y.

c) Find the length and breadth of the class room.

21. In the figure $\angle A = 45^0$. AB and CD are perpendicular to each other.

AD = 4 centimetres and BC = 8 centimetres.



a) What is $\angle ACD$?

b) Find the length of CD and BD.

c) Calculate the area of triangle ABC.

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

22. The perimeter of a rectangle is 30 centimetres and its area is 36 square centimetres. If x is the length and y is the breadth of the rectangle, then

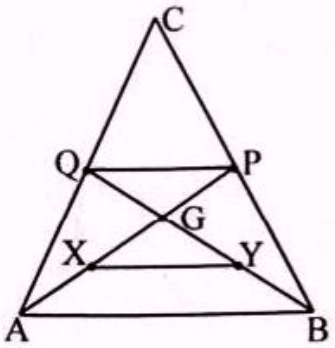
a) $x + y =$ _____

b) Find the area of a rectangle with each side 2 centimetres shorter than the length of the sides of the original rectangle.

c) Find the area of the rectangle when each side is increased by 1 centimetre.

23. Three times a number added to four times another number gives 37. Two times the second number subtracted from five times the first number gives 27. What are the numbers ?

24. In the figure, AP, BQ are two medians of triangle ABC. The midpoints of AG, BG are X and Y.



a) AG : GP = _____

[1:2, 2:1, 3:1, 3:2]

b) If AP=12 centimetres, find the lengths of AG and GP.

c) If AB=18 centimetres, find the lengths of PQ and XY.

25. When the length of a rectangle is increased by 1 metre and the breadth is decreased by 1metre, the area is decreased by 19 squaremetres.

a) By taking the length of the first rectangle as x and breadth as y, write the length and breadth of the second rectangle.

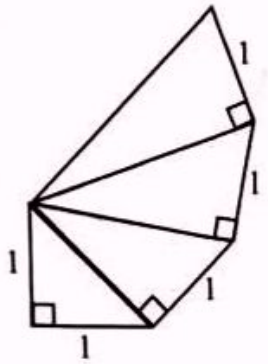
b) $(x+1)(y-1) = xy -$ _____

[1, 2, 18, 19]

c) Calculate $x - y$.

d) What is the increment in area of the new rectangle got by decreasing the length of the first rectangle by 1metre and increasing the breadth by 1metre?

26. Four right triangles are drawn as shown in the figure.

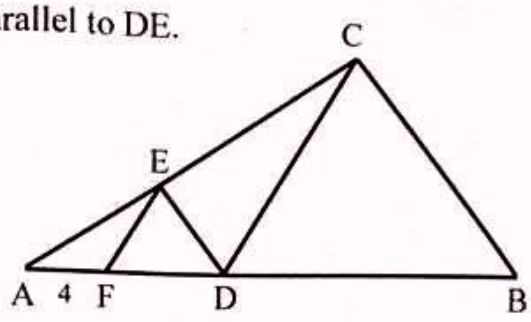


a) What is the length of hypotenuse of the smallest right triangle ?

b) Find the length of three sides of the fourth right triangle.

c) Calculate the sum of the perimeters of first and fourth right triangles up to a centimetre. ($\sqrt{2} \approx 1.414$, $\sqrt{3} \approx 1.732$, $\sqrt{5} \approx 2.236$)

27. In the figure CD is parallel to EF and BC parallel to DE.
AD = 10 centimetres, AF = 4 centimetres.



a) FD = _____

b) AE : EC = _____

c) Find the length of AB.

d) What is the ratio of the area of triangle ADC and triangle BDC?

28. A fraction simplified after subtracting 1 from the numerator becomes $\frac{1}{2}$.

If instead, 7 is added to the denominator and then simplified it becomes $\frac{1}{3}$.

a) By taking x as the numerator and y as the denominator, write the fraction.

b) Form equations using given details.

c) Write the fraction.

29. Read the given number pattern carefully and answer the following questions.
(1, 4, 9, 16, ... are square numbers)

$1 = 1 = 1^2$

$1^2 + 3 = 4 = 2^2$

$2^2 + 5 = 9 = 3^2$

.....

.....

.....

a) Write the next line.

b) What is the 15th square number?

c) What is the next square number in the sequence 676, 729, 784, ...

d) $1225 +$ _____ $= 36^2$

e) _____ $+ (2n + 1) = (n + 1)^2$.