

Time : 2½ Hours

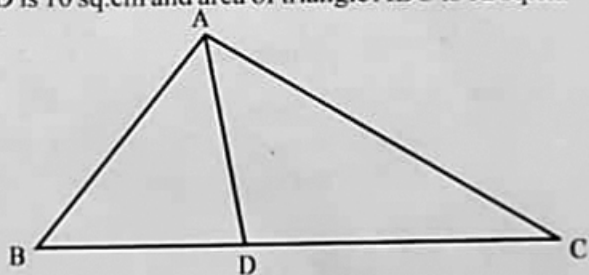
Score : 80

Instructions

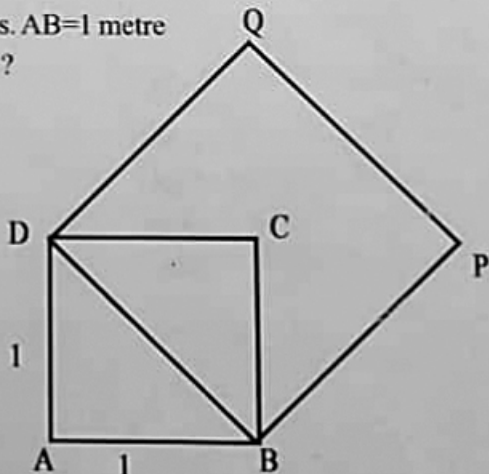
- Read the instructions before answering the questions
- Give explanations wherever necessary.
- Simplifications using approximate values of $\sqrt{2}$, $\sqrt{3}$ need to be done only if specifically asked.
- First 15 minutes time is cool – off time

Answer any three questions from 1 to 4. Each question carries 2 scores. (3X2 = 6)

- 1 In the figure area of triangle ABD is 10 sq.cm and area of triangle ADC is 12 sq.cm
- (a) Find BD:DC .
- (b) If BD=5cm, then find DC

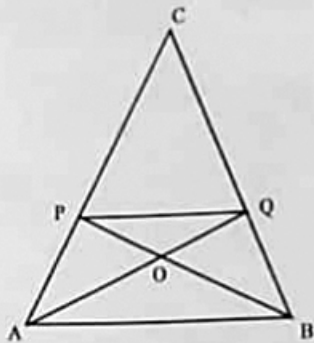


- 2 (a) Write the decimal form of $\frac{3}{4}$
- (b) How many $\frac{1}{10}$'s are in $\frac{3}{4}$?
- 3 The sum of two numbers is 26 and their difference is 2. Which are the numbers?
- 4 In the figure, ABCD and BPQD are squares. AB=1 metre
- (a) What is the area of the square BPQD ?
- (b) What is the length of BD ?



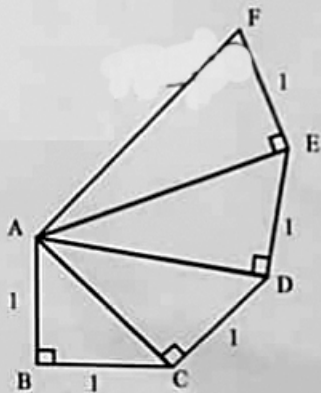
Answer any five questions from 5 to 11. Each question carries 3 scores (5x3=15)

- 5 (a) Draw a triangle of sides 6cm, 5cm, and 4cm.
 (b) Draw an isosceles triangle of the same area
- 6 In triangle ABC, PQ is parallel to AB. From the figure write three pairs of triangles of equal area.

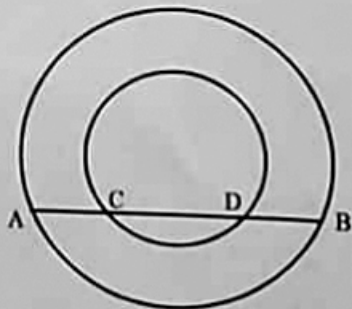


- 7 (a) Find three fractions getting closer and closer to $\frac{1}{3}$ and denominators as powers of 10.
 (b) Write the decimal form of $\frac{1}{3}$.
- 8 The length of a rectangle is 3cm more than its breadth and its perimeter is 50cm.
 (a) What is the sum of its length and breadth?
 (b) Find the length and breadth of the rectangle.

- 9 In the figure
 (a) What is length of AC?
 (b) Find the lengths of AD and AF
 (c) What is the difference between the perimeters of triangle ADE and triangle AEF?

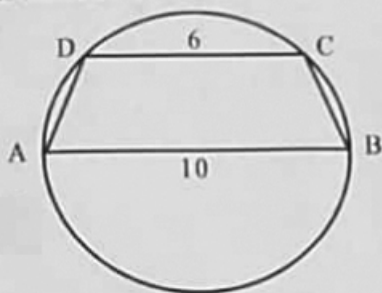


- 10 Draw a square of area 10 square centimetres.
- 11 The picture shows two circles centred at the same point and a line intersecting them. Prove that the parts of the line between the circles on either sides are equal.



Answer any seven questions from 12 to 21. Each question carries 4 scores. ($7 \times 4 = 28$)

- 12 The bottom side of the quadrilateral in the picture is diameter of the circle and the top side is a chord parallel to it. $AB = 10$ centimetres, $CD = 6$ centimetres.



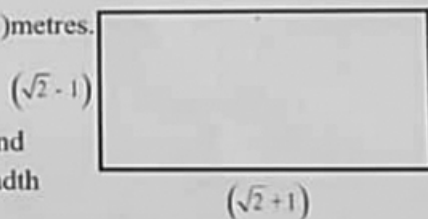
- (a) What is the radius of the circle?
 (b) Find the area of the quadrilateral ABCD.

- 13 (a) Write a two digit number with sum of its digits 9.
 (b) The sum of the digits of a two digit number is 9. The number got by interchanging the digits is 27 more than the original number. What is the number?

- 14 The difference of perimeters of two squares is 32 metres and the difference of their areas is 208 square metres.

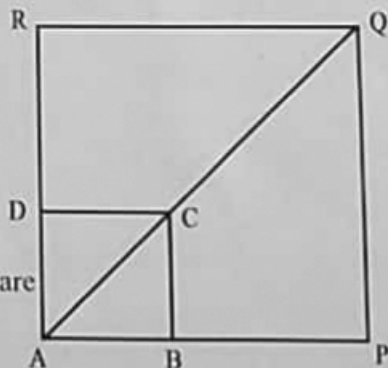
- (a) What is the difference between the lengths of their sides?
 (b) Find the lengths of their sides.

- 15 In the figure, length of the rectangle is $(\sqrt{2} + 1)$ metres and its breadth is $(\sqrt{2} - 1)$ metres



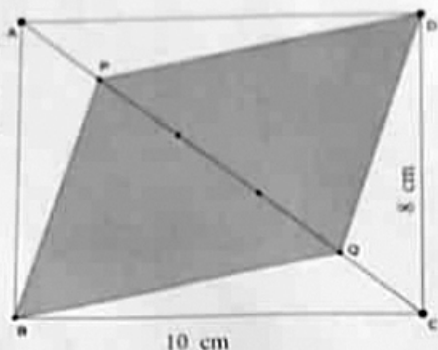
- (a) Find its area.
 (b) The area of a rectangle is 1 square metre and its length is $(2 + \sqrt{3})$ metres. Find its breadth correct to a centimetre. ($\sqrt{3} \approx 1.732$)

- 16 In the figure ABCD and APQR are squares. $AB = 1$ centimetre, $AP = 3$ centimetres.



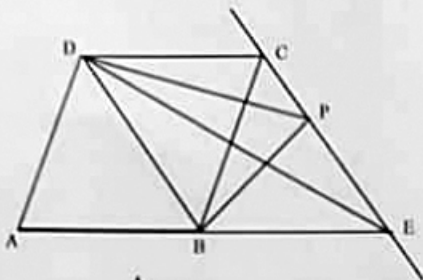
- (a) What is the length of the diagonal of square ABCD?
 (b) What is the length of the diagonal of square APQR?
 (c) How longer is the diagonal of the larger square than the diagonal of the smaller square?
 (d) If each side of a square is increased by 5 centimetres how much is the length of the diagonal be increased?

- 17 The length of the rectangle ABCD is 10 centimetres and its breadth is 8 centimetres. The diagonal AC is divided into 5 equal parts.
- What is area of triangle ACD?
 - What is area of triangle APD?
 - Find area of the shaded region.

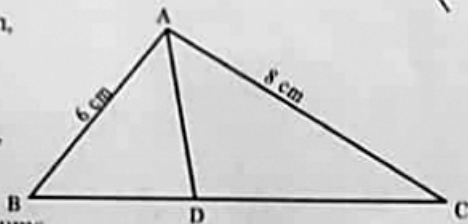


- 18 In the figure, CP is parallel to BD. If the area of triangle ABD is a and the area of triangle BCD is b , complete the table.

Shape	Area
Triangle BPD	
Quadrilateral ABCD	
Quadrilateral ABPD	
Triangle AED	



- 19 In triangle ABC, $\angle BAD = \angle CAD$, $AB = 6\text{cm}$, $AC = 8\text{cm}$.
- Find $BD:DC$
 - Draw a line of length 10 centimetres, and divide it in the ratio 3:4



- 20 Find the decimal forms of the following sums.

(a) $\frac{1}{5} + \frac{1}{5^2} + \frac{1}{5^3}$

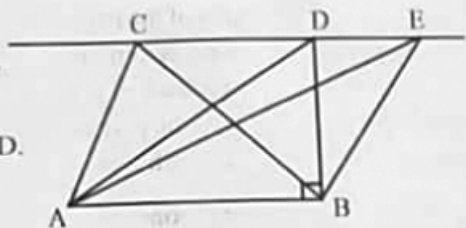
(b) $\frac{1}{2} + \frac{1}{4} + \frac{1}{8}$

- 21
- Write the decimal form of $\frac{1}{8}$
 - Write the decimal form of $\frac{5}{8}$
 - A two digit number divided by another two digit number gives 4.625. What are the numbers?

Answer any five questions from 22 to 28. Each question carries 5 scores (5x5=25)

- 22 Draw a pentagon and then draw a triangle of the same area.

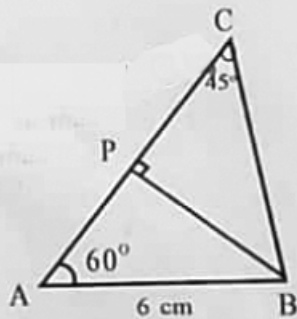
- 23 In the figure the distance between the parallel lines AB and CD is 4 centimetres.
AB = 6 centimetres.



- (a) Find the area of the right triangle ABD.
 (b) Find the perimeter of the right triangle ABD.
 (c) Among the two triangles ABD and ABE, which one has more perimeter?
 (d) Can you draw a triangle with area 12sq.cm. and perimeter 50cm with AB as one side?
- 24 (a) Write the decimal form of $\frac{1}{9}$.
 (b) Write the decimal form of $\frac{2}{9}$.
 (c) $0.111\dots + 0.444\dots = \dots\dots$
 (d) Write the decimal form of $\sqrt{0.444\dots}$

- 25 In triangle ABC, BP is perpendicular to the side AC.

$\angle A = 60^\circ$, $\angle C = 45^\circ$, AB = 6 centimetres.



- (a) What is the length of AP?
 (b) Find BP.
 (c) Find the area of triangle ABC
 (d) What is the perimeter of triangle ABC?
- 26 Find the product of the following pairs of numbers. Which are the pairs whose product is a natural number?

(a) $\sqrt{3}, \sqrt{12}$ (b) $\sqrt{0.3}, \sqrt{1.2}$ (c) $\sqrt{5}, \sqrt{7}$ (d) $\sqrt{0.5}, \sqrt{8}$ (e) $\sqrt{7\frac{1}{2}}, \sqrt{3\frac{1}{3}}$

- 27 (a) Add 2 to the denominator of the fraction $\frac{3}{7}$ and simplify it.

- (b) When we add 6 to the numerator of a fraction and simplify it, we get $\frac{1}{2}$. When we add 7 to the denominator of same fraction and simplify it, we get $\frac{1}{3}$. What is the original fraction?

- 28 The sum of lengths of the perpendicular sides of a right triangle is 26 centimetres and its area is 84 square centimetres.
- What is the product of perpendicular sides?
 - Find lengths of the perpendicular sides
 - Find length of the hypotenuse.

Read the mathematical concept explained below and answer the questions that follows (6x1=6)

- 29 Fractions with numerator 1 are called unit fractions.

Eg: $\frac{1}{2}, \frac{1}{3}, \frac{1}{100}$ etc.

We can find the sum and difference of two unit fractions with denominators as consecutive natural numbers as follows

$$1 + \frac{1}{2} = \frac{2+1}{1 \times 2} \qquad 1 - \frac{1}{2} = \frac{2-1}{1 \times 2} = \frac{1}{1 \times 2}$$

$$\frac{1}{2} + \frac{1}{3} = \frac{3+2}{2 \times 3} \qquad \frac{1}{2} - \frac{1}{3} = \frac{3-2}{2 \times 3} = \frac{1}{2 \times 3}$$

Look at the following pattern

$$1 - \frac{1}{2} = \frac{1}{1 \times 2} \qquad 1 = \frac{1}{1 \times 2} + \frac{1}{2}$$

$$\frac{1}{2} - \frac{1}{3} = \frac{1}{2 \times 3} \qquad \frac{1}{2} = \frac{1}{2 \times 3} + \frac{1}{3}$$

$$\frac{1}{3} - \frac{1}{4} = \frac{1}{3 \times 4} \qquad \frac{1}{3} = \frac{1}{3 \times 4} + \frac{1}{4}$$

- (a) Write the next line.

(b) $\frac{1}{10 \times 11} + \frac{1}{11} = \dots\dots\dots$

- (c) Write $\frac{1}{20}$ as the sum of two unit fractions.

- (d) Write $\frac{1}{30}$ as the difference of two unit fractions.

- (e) Write $\frac{1}{2}$ as the sum of three unit fractions.

- (f) If 'n' is a natural number, then write $\frac{1}{n}$ as the sum of two unit fractions.