Notes of Online class

Concepts

a) There are some special right triangles. The diagonal of a square makes two right triangles of angles $45°, 45°, 90°$

b) If the side opposite to $45°$ is 1 then the side opposite to $90°$ will be $\sqrt{2}$. The sides are in the ratio $1 : 1 : \sqrt{2}$

c) The altitude of an equilateral triangle makes two right triangles.The angles of these triangles are $30°, 60°, 90°$.
If the side opposite to $30°$ is 1, the side opposite to $90°$ will be 2, side opposite tos $60°$ will be $\sqrt{3}$

Worksheet 44

1) Consider a square of perimetre 40cm

a) What is the length of its side?

b) What is the length of its diagonal

c) What is the area of the square drawn on its diagonal?

a) Length of one side $= \frac{40}{4} = 10$**cm**

b) Two sides and the diagonal form a $45°, 45°, 90°$ **right triangle .**
The side opposite to $45°$ **is** 10**cm.**
$\therefore$ **the side opposite to** $90°$ **is** $10\sqrt{2}$**cm**

c) Area $= (10\sqrt{2})^2 = 100 \times 2 = 200$ **sq.cm**

2) The area and perimetre of a square are equal in number.

a) What is the length of its side?

b) What is the length of its diagonal?

c) What is the area of the square drawn on its diagonal?

a) $4a = a^2 \Rightarrow a = 4$

b) Length of the diagonal is $4\sqrt{2}$

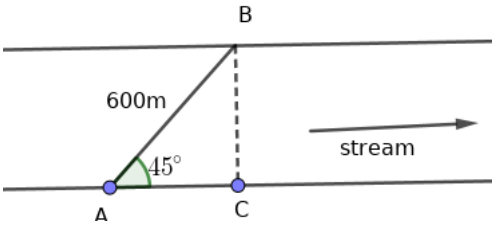
c) Area of the square drawn on the diagonal is $(4\sqrt{2})^2 = 16 \times 2 = 32$ **sq.unit**

3) A bridge of length 600m is built across a river making $45°$ angle with the direction of flow.

a) Draw a rough diagram.

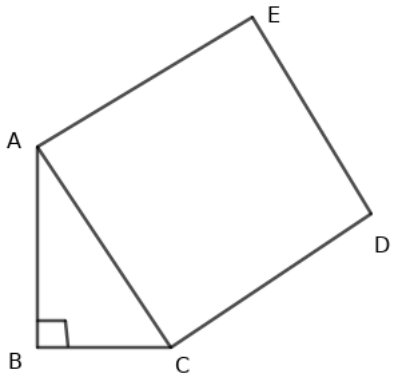
b) What is the width of the river?

a) Rough diagram is drawn below



b) Width of the river $BC = \frac{600}{\sqrt{2}}$ metre.

4) In traingle ABC ,$\angle A = 30°$, $BC = 10$cm



a) What is the length AB?

b) What is the length of the side AC?

c) What is the length of the diagonal of the square drawn on AC?

d) What is the perimetre of the square?

a) In a $30 - 60 - 90$ triangle ,side opposite to $30°$ is 10cm
Therefore side opposite tos $60°$ is $10\sqrt{3}$cm

b) Side opposite to $90°$ is 20cm

c) Length of diagonal of the square is $20\sqrt{2}$cm

d) Perimetre$= 4 \times 20\sqrt{2} = 80\sqrt{2}$cm

5) Consider an equilateral triangle of side 10cm

a) What is its altitude?

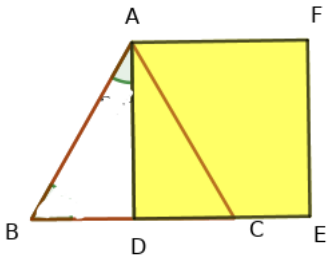
b) Draw a rough diagram of the square drawn on the altitude

c) What is the area of this square.

d) What is the length of its diagonal?

a) $\triangle ABD$ is a $30-60-90$ triangle. AD is the altitude. $AD = 5\sqrt{3}$cm

b) Figure



c) Area $= (5\sqrt{3})^2 = 25 \times 3 = 75$ sq.cm

d) Length of the diagonal is $5\sqrt{3} \times \sqrt{2} = 5\sqrt{6}$cm

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