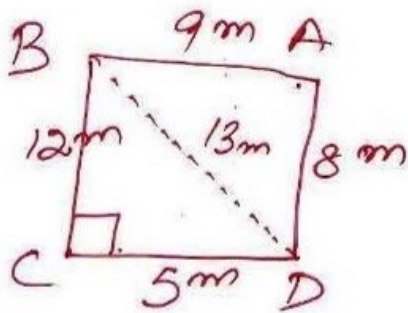


ix ex 12.2 Herons formula



const - join BD

Sol - In rt  $\triangle BCD$

$$BD^2 = BC^2 + CD^2 \text{ (Pythagoras theorem)}$$

$$= 12^2 + 5^2$$

$$= 144 + 25$$

$$= 169$$

$$BD = \sqrt{169}$$

$$= \sqrt{13 \times 13}$$

$$= 13 \text{ m}$$

$$\text{ar}(\triangle BCD) = \frac{1}{2} bh$$

$$= \frac{1}{2} \times 12 \times 5$$

$$= 30 \text{ m}^2$$

$$\text{ar}(\triangle ABD)$$

$$s = \frac{a+b+c}{2}$$

$$= \frac{8+9+13}{2}$$

$$= 15 \text{ m}$$

$$\text{area of } \triangle ABD$$

$$= \sqrt{s(s-a)(s-b)(s-c)}$$

$$= \sqrt{15(15-8)(15-9)(15-13)}$$

$$= \sqrt{15 \times 7 \times 6 \times 2}$$

$$= \sqrt{3 \times 5 \times 7 \times 2 \times 3 \times 2}$$

$$= 2 \times 3 \sqrt{35}$$

$$= 6 \sqrt{35} \text{ cm}^2$$

$$\text{area of } \square ABCD$$

$$= (30 + 6\sqrt{35}) \text{ cm}^2$$