



#### Exercise 4D

Question 1:

For a given triangle to be a right angled, the sum of the squares of the two sides must be equal to the square of the largest side.

(i) Let  $a = 9\text{cm}$ ,  $b = 16\text{ cm}$  and  $c = 18\text{ cm}$ . Then

$$(a^2 + b^2) = [9^2 + (16)^2] = (81 + 256)\text{ cm}^2 = 337\text{ cm}^2$$

$$\text{and } c^2 = (18)^2\text{ cm}^2 = 324\text{ cm}^2$$

$$\therefore (a^2 + b^2) \neq c^2$$

Hence the given triangle is not right angled.

(ii) Let  $a = 7\text{cm}$ ,  $b = 24\text{ cm}$  and  $c = 25\text{ cm}$ , Then

$$(a^2 + b^2) = [7^2 + (24)^2]\text{ cm}^2 = (49 + 576)\text{ cm}^2 \\ = 625\text{ cm}^2$$

$$c^2 = (25\text{ cm})^2 = 625\text{ cm}^2$$

$$\therefore (a^2 + b^2) = c^2$$

Hence, the given triangle is a right triangle.

(iii) Let  $a = 1.4\text{ cm}$ ,  $b = 4.8\text{ cm}$ , and  $c = 5\text{ cm}$

$$(a^2 + b^2) = [(1.4)^2 + (4.8)^2]\text{ cm}^2 = \\ = (1.96 + 23.04)\text{ cm}^2 = 25\text{ cm}^2$$

$$c^2 = (5\text{ cm})^2 = 25\text{ cm}^2$$

$$\therefore (a^2 + b^2) = c^2$$

Hence, the given triangle is a right triangle

(iv) Let  $a = 1.6$  cm,  $b = 3.8$  cm and  $c = 4$  cm

$$\begin{aligned}(a^2 + b^2) &= [(1.6)^2 + (3.8)^2] \text{ cm}^2 = \\&= (2.56 + 14.44) \text{ cm}^2 = 17 \text{ cm}^2 \\c^2 &= (4)^2 = 16 \text{ cm}^2 \\\therefore (a^2 + b^2) &\neq c^2\end{aligned}$$

Hence, the given triangle is not a right triangle

(v) Let  $p = (a - 1)$  cm,  $q = 2\sqrt{a}$  cm and  $r = (a + 1)$  cm

$$\begin{aligned}p^2 + q^2 &= [(a - 1)^2 + (2\sqrt{a})^2] \text{ cm}^2 \\&= (a^2 + 1 - 2a + 4a) \text{ cm}^2 \\&= (a^2 + 1 + 2a) \text{ cm}^2 = (a + 1)^2 \text{ cm}^2 \\r^2 &= (a + 1)^2 \text{ cm}^2 \\\therefore p^2 + q^2 &= r^2\end{aligned}$$

Hence, the given triangle is a right triangle

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