

Determine the value of x

Solve

$$(x+7)^2 + (5x-4)^2 = 39^2$$

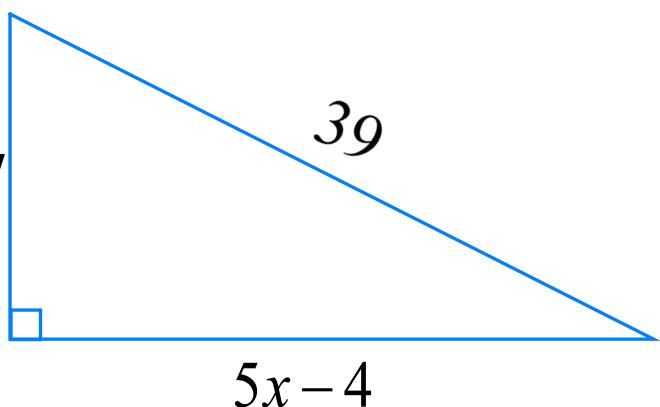
$$(x^2 + 14x + 49) + (25x^2 - 40x + 16) = 1521$$

$$26x^2 - 26x + 65 = 1521$$

$$\frac{26x^2 - 26x - 1456}{26} = 0$$

$$x^2 - x - 56 = 0$$

$$(x-8)(x+7) = 0$$



$$x-8=0 \quad \text{or} \quad x+7=0$$

$$x=8$$

$$x=-7$$

$$15, 36, 39$$

$$0, -39, 39$$

Not possible

$$\therefore x=8$$

Determine the numerical perimeter of the right triangle shown below. All measurements are in centimetres.

Below. All measurements are in centimetres.

$$(x-3)^2 + (3x-12)^2 = (2x-3)^2$$

$$(x^2 - 6x + 9) + (9x^2 - 72x + 144) = 4x^2 - 12x + 9$$

$$(2x-3) \quad 10x^2 - 78x + 153 = 4x^2 - 12x + 9$$

$$- 4x^2 + 12x - 9 \quad - 4x^2 + 12x - 9$$

Answer:

$$P = 5 + 12 + 13 = \underline{30 \text{ cm}}$$

$$\frac{6x^2 - 66x + 144}{6} = 0$$

$$\frac{b^2 - 4ac}{2a}$$

$$(3x-12)$$

$$1x^2 - 11x + 24 = 0$$

$$\sqrt{121 - 4(1)(24)} = \sqrt{25}$$

$$\sqrt{121 - 96} = \sqrt{25}$$

$$2(1)$$

$$x = \frac{11 \pm 5}{2}$$

$$x_1 = \frac{11+5}{2} = \frac{16}{2} = 8$$

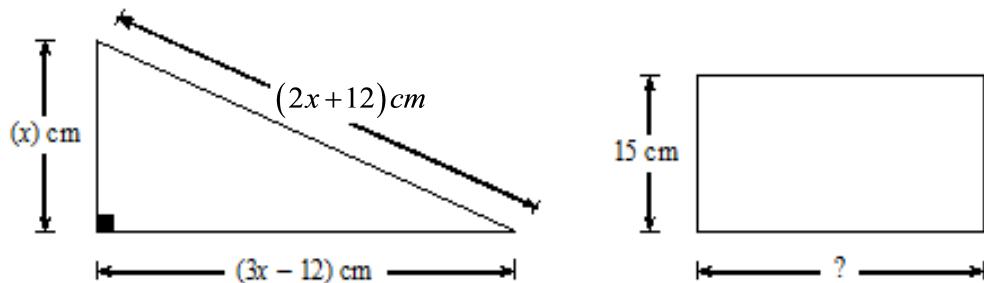
$$x_2 = \frac{11-5}{2} = \frac{6}{2} = 3$$

$$X$$

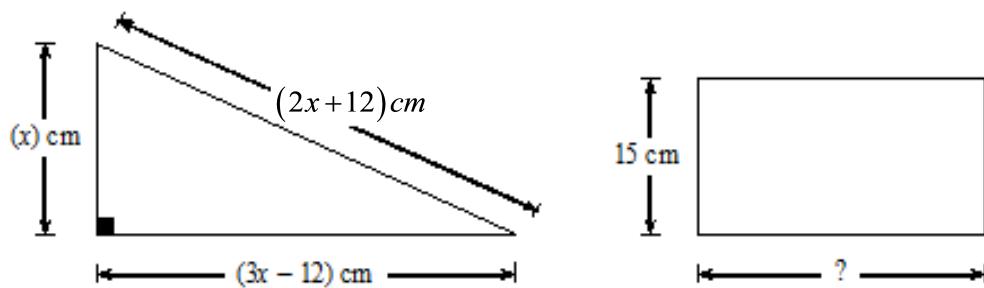
$$5, 12, 13$$

$$0, 3, 3$$

The right triangle and the rectangle given below are equivalent. The sides of the right angle of the triangle measure (x) cm and $(3x - 12)$ cm respectively and the hypotenuse measures $(2x + 12)$ cm. The height of the rectangle is 15 cm.



What is the numerical length of the base of the rectangle?



What is the numerical length of the base of the rectangle?

$$\textcircled{1} \quad x^2 + (3x - 12)^2 = (2x + 12)^2$$

$$x^2 + 9x^2 - 72x + 144 = 4x^2 + 48x + 144$$

$$10x^2 - 72x + 144 = 4x^2 + 48x + 144$$

$$6x^2 - 120x = 0$$

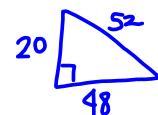
$$6x(x - 20) = 0$$

$$\rightarrow 6x = 0 \text{ or } x - 20 = 0$$

$$x = 0$$

$$x = 20$$

Reject



$$\textcircled{2} \quad A_T = A_R$$

$$\frac{48 \cdot 20}{2} = A_R \rightarrow L = \frac{480}{15}$$

$$480 \text{ cm}^2 = L \times W \quad L = \underline{\underline{32 \text{ cm}}}$$

$$480 = 15L$$