Quadratic Equations

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10^{th} Maths - Chapter 4

This is Problem-5from Exercise 4.2

1. The altitude of a right triangle is 7 cm less than its base.if the hypotenuse is 13 cm,find the other two sides.
   Solution:
   Given Data:
   altitude = x-7
   hypotenuse = 13

$$base^2 + altitude^2 = hypotenuse^2 \quad (1)$$
$$x^2 + (x-7) = (13)^2 \quad (2)$$
$$x^2 + x^2 + (49) - 14x = (169(2x)^2 - (14x) - (120) = (0) \quad (3)$$
$$(x)^2 - (7x) - (60) = (0)(x)^2 \quad (4)$$
$$(12x) + (5x) - (60) = (0)x(x-12) + 5(x-12) = 0 \quad (5)$$
$$(X+5)(x-12) = 0 \quad (6)$$
$$x = -12or5 \quad (7)$$
$$(8)$$

   sides cannot be negative so x=12
   so, base = 12cm,BC = 12
   ab = (12-7)=5