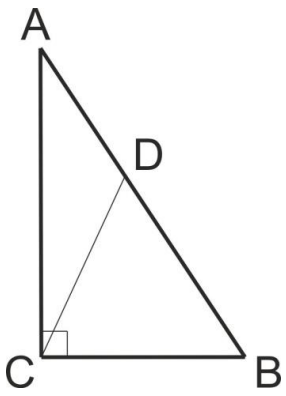

$AD = x$

$DB = x + 4$

$\frac{AD}{CD} = \frac{CD}{DB}$

$\frac{x}{12} = \frac{12}{x+4}$

$x(x+4) = 144$

$x^2 + 4x - 144 = 0$

$a^2x + bx + c = 0$

$D = b^2 - 4ac$

$D = 16 + 4 \times 144 = 592$

$x_{1,2} = \frac{-b \pm \sqrt{D}}{2}$

$x_1 = \frac{-4 + 4\sqrt{37}}{2} = -2 + 2\sqrt{37}$

$x_2 = \frac{-4 - 4\sqrt{37}}{2} = -2 - 2\sqrt{37}$

$AD = 2\sqrt{37} - 2$

$DB = 2\sqrt{37} + 2$

$AB = 4\sqrt{37}$