24. The length of the hypotenuse of a particular right-angled triangle is given by $\sqrt{1 + 3 + 5 + 7 + \ldots + 25}$. The lengths of the other two sides are given by $\sqrt{1 + 3 + 5 + \ldots + x}$ and $\sqrt{1 + 3 + 5 + \ldots + y}$ where x and y are positive integers. What is the value of $x + y$?

A 12   B 17   C 24   D 28   E 32

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24. **E** $1 + 3 + 5 + 7 + \ldots + (2n + 1) = (n + 1)^2$. The n in the three cases given is 12, $\frac{1}{2}(x - 1)$ and $\frac{1}{2}(y - 1)$. So, the triangle has sides of length $12 + 1$, $\frac{1}{2}(x - 1) + 1$ and $\frac{1}{2}(y - 1) + 1$. However the only right-angled triangle having sides of whole number length with hypotenuse 13 is the $(5, 12, 13)$ triangle. So $x = 9$ and $y = 23$ (or vice versa). Hence $x + y = 32$.