In the right triangle sketched above the altitude perpendicular to the hypotenuse has length $h$. Express the length of the hypotenuse $c$ as a function of the perimeter (and $h$).

**Solution by Dan Jurca**

The perimeter $P=a+b+c$; hence $a+b=P-c$. From the relation $ab=ch$ we have

\[
\begin{align*}
c^2 &= a^2 + b^2 \\
  &= (a+b)^2 - 2ab \\
  &= (P-c)^2 - 2ch \\
  &= P^2 - 2Pc + c^2 - 2ch
\end{align*}
\]

so \[(2P+2h)c = P^2\]

and finally \[c = \frac{P^2}{2(P+h)}\].