Es 206 del Demidovic: calcolare $\lim_{x\to 4} \dfrac{3-\sqrt{5+x}}{1-\sqrt{5-x}}$.

Svolgimento: si ponga $y = \sqrt{5-x}$ allora

$$\begin{aligned}
\lim_{x\to 4} \frac{3-\sqrt{5+x}}{1-\sqrt{5-x}} &= \lim_{y\to 1} \frac{3-\sqrt{10-y^2}}{1-y} \\
&= \lim_{y\to 1} \frac{3-\sqrt{10-y^2}}{1-y} \cdot \frac{3+\sqrt{10-y^2}}{3+\sqrt{10-y^2}} \\
&= -\lim_{y\to 1} \frac{1-y^2}{(1-y)\big(3+\sqrt{10-y^2}\big)} \\
&= -\lim_{y\to 1} \frac{1+y}{3+\sqrt{10-y^2}} = -\frac{1}{3}.
\end{aligned}$$