$$
\begin{array}{r}
x+1 \\
x+2\overline{)\,x^2+3x+5} \\
\underline{x^2+2x} \\
x+5 \\
\underline{x+2} \\
3
\end{array}
$$

$x^2+3x = x(x+2)+x$

$x+5 = 1\cdot(x+2)+3$

$\therefore x = 1\cdot(x+2)+3-5$

$\therefore x^2+3x = x(x+2)+1\cdot(x+2)+3-5$

$=(x+2)\{x+1\}+3-5$

$\therefore x^2+3x+5 = (x+2)(x+1)+3$