

$$\begin{aligned}
(a+b+c+d)(x+y+z+w) &= (a+(b+c+d))(x+y+z+w) \\
&= a(x+y+z+w) + (b+c+d)(x+y+z+w) \\
&= a(x+y+z+w) + (b+(c+d))(x+y+z+w) \\
&= a(x+y+z+w) + b(x+y+z+w) \\
&\quad + (c+d)(x+y+z+w) \\
&= a(x+y+z+w) + b(x+y+z+w) \\
&\quad + c(x+y+z+w) + d(x+y+z+w) \\
&= ax+ay+az+aw+bx+by+bz+bw \\
&\quad + cx+cy+cz+cw+dx+dy+dz+dwc.
\end{aligned}$$