$$
\begin{aligned}
A_1 &= \left| \int_0^1 (f(x) - g(x))\,\mathrm{d}x \right| + \left| \int_1^2 (g(x) - h(x))\,\mathrm{d}x \right| \\
&= \left| \int_0^1 (x^2 - 3x)\,\mathrm{d}x \right| + \left| \int_1^2 (x^2 - 5x + 6)\,\mathrm{d}x \right| \\
&= \left| \frac{x^3}{3} - \frac{3}{2}x^2 \right|_0^1 + \left| \frac{x^3}{3} - \frac{5}{2}x^2 + 6x \right|_1^2 \\
&= \left| \frac{1}{3} - \frac{3}{2} \right| + \left| \frac{8}{3} - \frac{20}{2} + 12 - \left(\frac{1}{3} - \frac{5}{2} + 6 \right) \right| \\
&= \left| -\frac{7}{6} \right| + \left| \frac{28}{6} - \frac{23}{6} \right| = \frac{7}{6} + \frac{5}{6} = 2\,\mathrm{FE}
\end{aligned}
\tag{6.40}
$$