

$$\begin{aligned}
 & \int_0^1 \frac{x^2+2}{x+2} dx \\
 &= \int_0^1 \frac{(x+2)(x-2)+6}{x+2} dx \\
 &= \int_0^1 \left(x-2 + \frac{6}{x+2} \right) dx \\
 &= \left[\frac{1}{2}(x-2)^2 + 6 \log|x+2| \right]_0^1 \\
 &= \frac{1}{2} \times 1^2 + 6 \log 3 - \frac{1}{2} \times 4 - 6 \log 2 \\
 &= \boxed{-\frac{3}{2} + 6 \log \frac{3}{2}}
 \end{aligned}$$

$$\begin{array}{r|rr}
 1 & 0 & 2 & \underline{-2} \\
 & -2 & 4 & \\
 \hline
 & 1 & -2 & 6
 \end{array}$$