3.

$$\int \frac{(x^2+2)\,dx}{x+1}$$

Solution:

Let $I = \int \frac{x^2+2}{x+1}\,dx$

So, $I = \int \left[(x-1) + \frac{3}{x+1}\right] dx$

$= \int (x-1)\,dx + 3\int \frac{1}{x+1}\,dx$

$= \frac{x^2}{2} - x + 3\log|x+1| + C$

Therefore,

$$I = \frac{x^2}{2} - x + 3\log|x+1| + C$$

Performing long division of the given integeral, we have

$$\begin{array}{r|l} x+1 \;)\; x^2+2 & (x-1 \\ \underline{(-)\;\;(-)} & \\ x^2+x & \\ \hline -x+2 & \\ \underline{-x-1} & \\ (+)\;\;(+) & \\ \hline 3 & \end{array}$$