Brief Review of Partial Fractions

Ex: $\dfrac{s^3+2s+1}{s^2+s-2} = s-1 + \dfrac{5s-1}{s^2+s-2}$

$= s-1 + \dfrac{5s-1}{(s+2)(s-1)}$

$= s-1 + \dfrac{a}{s+2} + \dfrac{b}{s-1}$

$$
\begin{array}{r}
s-1 \\
s^2+s-2 \overline{)\, s^3+2s+1} \\
\underline{s^3+s^2-2s} \\
-s^2+4s+1 \\
\underline{-s^2-s+2} \\
5s-1
\end{array}
$$

Ex $\dfrac{s-1}{(s+1)(s^2+s+1)} = \dfrac{a}{s+1} + \dfrac{bs+c}{s^2+s+1}$

Ex $\dfrac{2}{s^3(s+1)^2(s^2+1)^2} = \dfrac{a}{s} + \dfrac{b}{s^2} + \dfrac{c}{s^3} + \dfrac{d}{s+1} + \dfrac{e}{(s+1)^2}$

$+ \dfrac{fs+g}{s^2+1} + \dfrac{hs+i}{(s^2+1)^2}$