$$y''(t) + y(t) = 3 \sin 2t \; u(t) \qquad \begin{matrix} y(0) = 0 \\ y'(0) = 3 \end{matrix}$$

$$\left(s^2 Y(s) - s y(0) - y'(0) \right) + Y(s) = \frac{6}{s^2+4}$$

$$(s^2+1) Y(s) = 3 + \frac{6}{s^2+4} = \frac{3s^2+18}{s^2+4}$$

$$Y(s) = \frac{3s^2+18}{(s^2+4)(s^2+1)}$$

$$= \frac{As+B}{(s^2+4)} + \frac{Cs+D}{(s^2+1)}$$

A et C = 0 font apparaître des termes en s^2 et s

$$\begin{cases} B + D = 3 \\ B + 4D = 18 \end{cases} \Rightarrow \begin{matrix} 3D = 15 \\ D = 5 \end{matrix}$$

$$\Rightarrow B = -2$$

$$Y(s) = \frac{-2}{s^2+4} + \frac{5}{s^2+1}$$

$$\boxed{y(t) = (5 \sin t - \sin 2t)\, u(t)}$$