$(D^2-4)y = \sin^2 x$

C.F $\quad D^2-4=0 \Rightarrow (D+2)(D-2)=0$

$\Rightarrow D = 2, -2$

$$C.F = c_1 e^{2x} + c_2 e^{-2x}$$

P.I $\quad \dfrac{\sin^2 x}{(D^2-4)} = \dfrac{1-\cos 2x}{2(D^2-4)} = \dfrac{1}{2(D^2-4)} - \dfrac{\cos 2x}{2(D^2-4)}$

$$= \frac{e^{0x}}{2(D^2-4)} - \frac{\cos 2x}{2(D^2-4)}$$

(replace D by 0) ↙ ↘ (replace D^2 by $-(2)^2$)

$$= \frac{e^{0x}}{2(-4)} - \frac{\cos 2x}{2(-4-4)} \Rightarrow \boxed{-\frac{1}{8} + \frac{\cos 2x}{16}} \rightarrow \text{P.I}$$

Thus $\quad y = C.F + P.I$

$$\boxed{y = c_1 e^{2x} + c_2 e^{-2x} - \frac{1}{8} + \frac{\cos 2x}{16}}$$