Solution (#1720) Applying the Laplace transform we find

$$s\overline{f}(s) - 1 + \frac{\overline{f}(s)}{s} = \frac{1}{s} + \frac{1}{s^3}$$

so that

$$\overline{f}(s) = \frac{s}{s^2+1} + \frac{1}{s^2}.$$

Applying the inverse Laplace transform we find

$$f(x) = \cos x + x.$$