> with(DETools) :

> ode := x^4· y'''(x) + x^3·y''(x) = 1

$$ode := x^4 \left(\frac{d^3}{dx^3}\, y(x)\right) + x^3 \left(\frac{d^2}{dx^2}\, y(x)\right) = 1 \qquad (1)$$

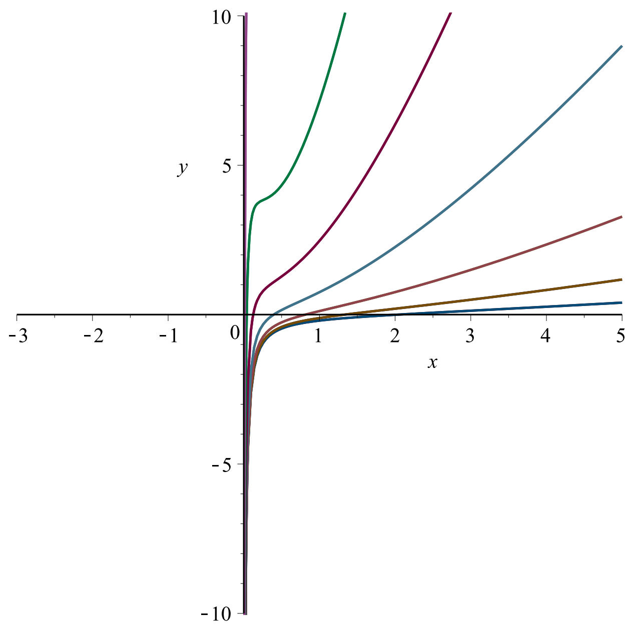
> a_ode := dsolve(ode, y(x))

$$a\_ode := y(x) = \ln(x)\, x\, \_C1 - x\, \_C1 - \frac{1}{4\,x} + \_C2\, x + \_C3 \qquad (2)$$

> tp_1 := seq(subs(_C1 = exp(j), _C2 = exp(j), _C3 = exp(j), rhs(a_ode)), j = -3 ..3)

$$tp\_1 := \ln(x)\, x\, e^{-3} - \frac{1}{4\,x} + e^{-3}, \ln(x)\, x\, e^{-2} - \frac{1}{4\,x} + e^{-2}, \ln(x)\, x\, e^{-1} - \frac{1}{4\,x} + e^{-1}, \ln(x)\, x - \frac{1}{4\,x} + 1, \ln(x)\, x\, e - \frac{1}{4\,x} + e, \ln(x)\, x\, e^{2} - \frac{1}{4\,x} + e^{2}, \ln(x)\, x\, e^{3} - \frac{1}{4\,x} + e^{3} \qquad (3)$$

> plot([tp_1, tp_1(1)], x = -3 ..5, y = -10 ..10)



>

> ode2 := y''(x) + 2·y'(x) + 5 y(x) = -2·sin(x)

$$ode2 := \frac{d^2}{dx^2}\, y(x) + 2 \left(\frac{d}{dx}\, y(x)\right) + 5\, y(x) = -2 \sin(x) \qquad (4)$$

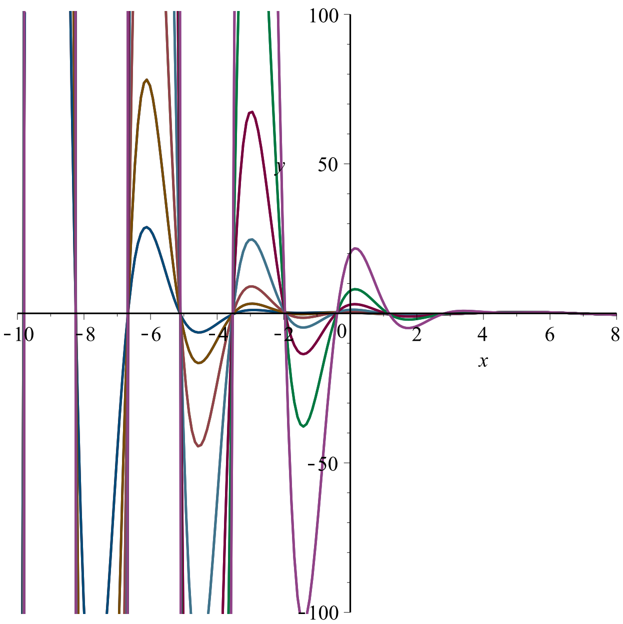
> a_ode2 := dsolve(ode2, y(x))

$$a\_ode2 := y(x) = e^{-x}\sin(2x)\ \_C2 + e^{-x}\cos(2x)\ \_C1 - \frac{2}{5}\sin(x) + \frac{1}{5}\cos(x) \quad \textbf{(5)}$$

> tp_2 := seq(subs(_C1 = exp(j), _C2 = exp(j), rhs(a_ode2)), j = -3..3)

$$tp\_2 := e^{-x}\sin(2x)\,e^{-3} + e^{-x}\cos(2x)\,e^{-3} - \frac{2}{5}\sin(x) + \frac{1}{5}\cos(x),\ e^{-x}\sin(2x)\,e^{-2} + e^{-x}\cos(2x)\,e^{-2} - \frac{2}{5}\sin(x) + \frac{1}{5}\cos(x),\ e^{-x}\sin(2x)\,e^{-1} + e^{-x}\cos(2x)\,e^{-1} - \frac{2}{5}\sin(x) + \frac{1}{5}\cos(x),\ e^{-x}\sin(2x) + e^{-x}\cos(2x) - \frac{2}{5}\sin(x) + \frac{1}{5}\cos(x),\ e^{-x}\sin(2x)\,e + e^{-x}\cos(2x)\,e - \frac{2}{5}\sin(x) + \frac{1}{5}\cos(x),\ e^{-x}\sin(2x)\,e^{2} + e^{-x}\cos(2x)\,e^{2} - \frac{2}{5}\sin(x) + \frac{1}{5}\cos(x),\ e^{-x}\sin(2x)\,e^{3} + e^{-x}\cos(2x)\,e^{3} - \frac{2}{5}\sin(x) + \frac{1}{5}\cos(x) \quad \textbf{(6)}$$

> plot([tp_2, tp_2(1)], x = -10..8, y = -100..100)



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