

$$y' = 6x^2 - 4x^{-1}, y(1) = 0$$

Integrate both sides:

$$y = \int (6x^2 - 4x^{-1}) dx = 2x^3 - 4\ln|x| + C$$

Apply initial condition:

$$y(1) = 2(1)^3 - 4\ln(1) + C = 0$$

$$\rightarrow 2 + C = 0$$

$$C = -2$$

So,

$$y = 2x^3 - 4\ln|x| - 2$$