

② Separate the following differential equation and integrate to find the general solution (for this problem, do not attempt any "simplifications" of your unknown parameter "C"):

Work $y' + y^8 \sin(4x) = 0$

General Solution (implicitly):

$$-\frac{1}{7}y^{-7} = \frac{1}{4} \cos(4x) + C$$

$$\frac{y'}{y^8} = \frac{-y^8 \sin(4x)}{y^8}$$

$$\frac{1}{y^8} \frac{dy}{dx} = -\sin(4x)$$

$$\frac{1}{y^8} dy = -\sin(4x) dx$$

$$-\frac{1}{7y^7} = \frac{\cos 4x}{4} + C$$

$$\frac{1}{y^8} = y^{-8}$$

$$\frac{y^{-7}}{-7} = -\frac{1}{7y^7}$$

$$-\sin(4x)$$

$$u = 4x$$

$$du = 4 dx$$

$$dx = \frac{1}{4} du$$

$$\frac{y^{n+1}}{n+1}$$

$$\sin(u) = -\cos(u)$$

$$-\frac{1}{4} \int \sin(u)$$

$$-\frac{1}{4} (-\cos(u)) = \frac{1}{4} \cos 4x$$