

Quiz 5 MTH 335 Fall 2026

Sunday, September 13, 2026

9:24 AM

Solve

$$ty' + 2y = \frac{\sin(t)}{t}$$

Soln: First put into standard form by dividing by t :

$$(*) \quad y' + \frac{2}{t}y = \frac{\sin(t)}{t^2}$$



Compute integrating factor

$$\mu = e^{\int \frac{2}{t} dt} = e^{2 \ln(t)} = e^{\ln(t^2)} = t^2$$

$\log(x^p) = p \log(x)$

So multiply (*) by μ :

$$t^2 y' + 2ty = \sin(t)$$

Rewrite left side:

$$(t^2 y)' = \sin(t)$$



$$t^2 y = \int \sin(t) dt = -\cos(t) + C$$

↓ solve for y

$$y = \frac{-\cos(t)}{t^2} + \frac{C}{t^2}$$