(1)

$$y' = tan(y) cos(x)$$
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$$\int \frac{dx}{tan(y)} = \int cos(x)dx$$

$$\int \frac{cos(y)dy}{sin(y)} = sin(x) + C$$

$$\int \frac{dshn(y)}{sin(y)} = \int \frac{dsin(y)}{sin(y)} = \frac{sin(y)}{sin(x)}$$

$$\int \frac{dshn(y)}{sin(y)} = \int \frac{sin(y)}{cos(x)} cos(x)$$

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$$\begin{cases} y'' + y' = -8 & \text{sh. } 2x - 6 & \text{con} 2x \\ y'' + y' = -8 & \text{sh. } 2x - 6 & \text{con} 2x - 5e^{-x} \\ \end{bmatrix}$$
Deriving:
$$y'' - yy' = -16 & \text{con}(2x) + 12 & \text{sh.}(2x) + 5e^{-x} \\ \end{bmatrix}$$
This traction form A:
$$5y' = -20 & \text{si.}(2x) + 10 & \text{con}(2x) - 5e^{-x} \\ y'' = -4 & \text{si.}(2x) + 2 & \text{con}(2x) - e^{-x} \\ \end{bmatrix}$$

$$y'' = -4 & \text{si.}(2x) + 2 & \text{con}(2x) - e^{-x} \\ \end{bmatrix}$$

$$y'' = y'' + 2 & \text{con}(2x) + 3 & \text{si.}(2x) + e^{-x} \\ \end{bmatrix}$$

$$2y'' + y'' = -8 & \text{con}(2x) - 4 & \text{sh.}(2x) + e^{-x} - 4 & \text{sh.}(2x) + e^{-x} \\ +2 & \text{con}(2x) - 2 & \text{con}(2x) - 2 & \text{sh.}(2x) + e^{-x} + 4 & \text{yo} + 2 & \text{con}(2x) \\ +4 & \text{sh.}(2x) + 4e^{-x} = 5e^{-x} + 4 & \text{yo} = 5e^{-x} \\ \end{bmatrix}$$
Thus 
$$y'' + y'' = -3 & \text{con}(2x) - 4 & \text{sh.}(2x) + e^{-x} + 4 & \text{yo} + 2 & \text{con}(2x) \\ +4 & \text{sh.}(2x) + 4e^{-x} = 5e^{-x} + 4 & \text{yo} = 5e^{-x} \\ \end{bmatrix}$$

Final solution: g(x) = 2cos(xx) + 8lu(x) + e-x