#9

$$(\cos x)\frac{dy}{dx} + y\sin x = \sin x\cos x, \qquad -\frac{\pi}{2} < x < \frac{\pi}{2}$$

Divide by $\cos x$ (OK since $\cos x > 0$ on $-\frac{\pi}{2} < x < \frac{\pi}{2}$)

$$\frac{dy}{dx} + y\tan x = \sin x$$

$$\mu(x) = e^{\int \tan x\,dx} = e^{\ln|\sec x|} = e^{\ln(\sec x)} \quad (\sec x > 0 \text{ too})$$

$$= \sec x$$

$$\sec x\left(\frac{dy}{dx} + y\tan x\right) = \sin x\sec x$$

$$\frac{d}{dx}\left(y\sec x\right) = \tan x$$

$$y \sec x = \int \tan x \, dx$$

$$y \sec x = \ln(\sec x) + C$$

Use initial value $y(0) = 5$

$$5(1) = \ln 1 + C \implies C = 5 - 0 = 5$$

So $y \sec x = \ln(\sec x) + 5$

$$\boxed{y = (\cos x)\ln(\sec x) + 5\cos x}$$