

1. Solve the following:

(a) $y' = xe^{-\sin x} - y \cos x$

(b) $(3y^2 + 2y)y' = x \cos x$

2. Solve the following initial value problems:

(a) $\frac{dy}{dx} = \frac{y \cos x}{1+y^2}$, $y(0) = 1$

(b) $xyy' = \ln x$, $y(1) = 2$

(c) $y' + y = \sqrt{x}e^{-x}$, $y(0) = 3$

(d) Solve the IVP $x\frac{dy}{dx} - y = 2x^2y$, $y(1) = 1$

(e) Solve: $xy' + (2x - 3)y = 4x^4$

(f) Solve the IVP $y' = (1 - y)\cos x$, $y(\pi) = 2$