

Solve:

1) Solve $\frac{dy}{dx} = \csc^2(2x)$

subject to the initial condition $y(\pi/8) = -1$.

2) Solve $\frac{dy}{dx} = -\sec^2(-3x)$

subject to the initial condition $y(-\pi/12) = 2$.

3) Solve $\frac{dy}{dx} = -3\sec^2(3x)$

subject to the initial condition $y(\pi/12) = 0$.

4) Solve $\frac{dy}{dx} = -5x^2 + x - 4$

subject to the initial condition $y(1) = -3$.

5) Solve $\frac{dy}{dx} = 2\cos(x)$

subject to the initial condition $y(\pi/2) = 3$.

6) Solve $\frac{dy}{dx} = -4x^2 - 4x - 2$

subject to the initial condition $y(0) = 3$.

7) The velocity of a particle moving along the x-axis is given by $v(t) = 2t^2 + 3$. Find its position as a function of t if $s(0) = -2$.

8) A particle moving along a straight line has an acceleration $a = 4t$. When $t = 0$, the velocity v of the particle and its position s are respectively equal to 3 and 4. Find its position s as a function of time t .