1. Solve

\[ y'(x) = \frac{3y^2 - x^2}{2xy}. \]  

(1)

Let

\[ y = vx \]  

(2)

\[ \frac{dy}{dx} = v + x \frac{dv}{dx} \]  

(3)

Substituting (2) and (3) in (1), we get

\[ x \frac{dv}{dx} = \frac{v^2 - 1}{2v}. \]

By separation of variables, we have,

\[ \frac{2v}{v^2 - 1}dv = \frac{dx}{x}. \]

Integrating both sides, we get

\[ \ln u = \ln x + \ln c \]
where \( u = v^2 - 1, \ du = 2vdv \) and \( c \) is an arbitrary constant.

Therefore, \( u = cx \).

Hence, \( v^2 - 1 = cx \). Substituting \( v = \frac{u}{x} \) into the above equation, we get,

\[
y^2 = x^2 + c x^3.
\]

2. Solve \( \frac{dy}{dx} = \frac{x^2}{1-y^2}, \ y(0) = 1. \)

By separation of variables, we get

\[
(1 - y^2)dy = x^2dx.
\]

Integrating on both sides, we get,

\[
y - \frac{y^3}{3} = \frac{x^3}{3} + c
\]

where \( c \) is an arbitrary constant. By the initial condition, we obtain \( c = \frac{2}{3} \). Therefore,

\[
y - \frac{y^3}{3} = \frac{x^3}{3} + \frac{2}{3}.
\]