Bernoulli Equations

Bernoulli equation:

\[
\frac{dy}{dx} + p(x)y = q(x)y^n \quad (n \neq 0, 1)
\]

Solution:

Take \(y^n\) to the other side:

\[
y^{-n}\frac{dy}{dx} + p(x)y^{1-n} = q(x) \quad (n \neq 0, 1)
\]

Putting \(u = y^{1-n}\) gives a linear equation:

\[
\frac{1}{1-n} \frac{du}{dx} + p(x)u = q(x)
\]