Bernoulli Equations

Bernoulli equation:

$$\frac{\mathrm{d}y}{\mathrm{d}x} + p(x)y = q(x)y^n \qquad (n \neq 0, 1)$$

Solution:

Take y^n to the other side:

$$y^{-n}\frac{\mathrm{d}y}{\mathrm{d}x} + p(x)y^{1-n} = q(x) \qquad (n \neq 0, 1)$$

Putting $u = y^{1-n}$ gives a linear equation:

$$\frac{1}{1-n}\frac{\mathrm{d}u}{\mathrm{d}x} + p(x)u = q(x)$$