Generalised 1st order form:

$$\tau\dot{x} + x = Ku(t)$$

Response to unit step input:

$$x(t) = K\left(1 - e^{-t/\tau}\right)$$

Proof:

1) Take the Laplace transform:

$$\tau sX + X = KU$$

The unit step function in Laplace form (s-space) is: $\frac{1}{s}$

Therefore:

$$\tau sX + X = K\frac{1}{s}$$
$$X(\tau s + 1) = K\frac{1}{s}$$
$$X = K\frac{1}{s}\frac{1}{(\tau s + 1)}$$
$$X = K\frac{1}{s(\tau s + 1)}$$

2) Perform partial fractions (after isolating s terms):

$$X = K\frac{1/\tau}{s(s + 1/\tau)} = K\left(\frac{A}{s} + \frac{B}{s + 1/\tau}\right)$$
$$K\frac{1/\tau}{s(s + 1/\tau)} = K\left(\frac{A(s + 1/\tau) + B(s)}{s(s + 1/\tau)}\right)$$
$$\frac{1}{\tau} = A\left(s + \frac{1}{\tau}\right) + B(s)$$

Let $s = -\frac{1}{\tau}$

$$\frac{1}{\tau} = A(0) + B(s)$$
$$B = -1$$

Let $s = 0$

$$\frac{1}{\tau} = A\left(\frac{1}{\tau}\right) + B(0)$$
$$A = 1$$

Therefore,

$$X = K\left(\frac{1}{s} - \frac{1}{s + 1/\tau}\right)$$

3) Now take the inverse Laplace:

$$L^{-1}\{X\} = x(t) = K\left(L^{-1}\left\{\frac{1}{s}\right\} - L^{-1}\left\{\frac{1}{s + 1/\tau}\right\}\right)$$

Inverse Laplace rule:

$$L^{-1}\left\{\frac{1}{s + a}\right\} = e^{-at}$$

Therefore:

$$\boxed{x(t) = K\left(1 - e^{-(1/\tau)t}\right)}$$