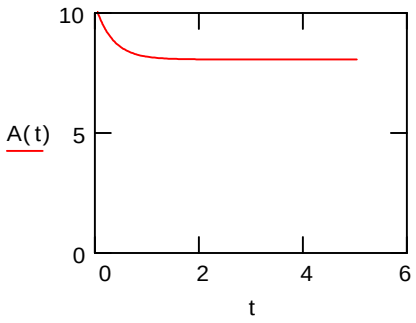
Last Step of Chem Lab

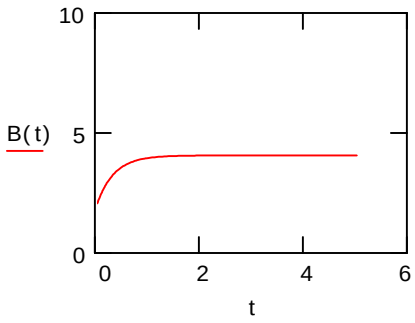
Set up the initial values and the time interval: $B0 := 2 \quad A0 := 10 \quad t := 0, .01 .. 5$

Start with these values of the proportionality constants: $k1 := 1 \qquad k2 := 2$

$$A(t) := \frac{k1 \cdot A0 - k2 \cdot B0}{k1 + k2} \cdot \exp(-(k1 + k2) \cdot t) + \frac{k2}{k1 + k2} \cdot (A0 + B0)$$

$$B(t) := \frac{k2 \cdot B0 - k1 \cdot A0}{k1 + k2} \cdot \exp(-(k1 + k2) \cdot t) + \frac{k1}{k1 + k2} \cdot (A0 + B0)$$



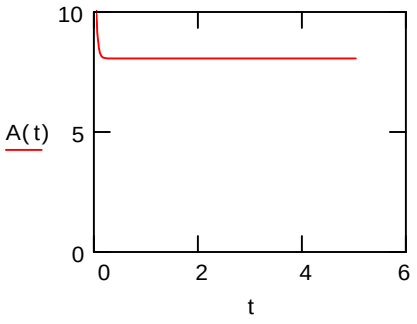


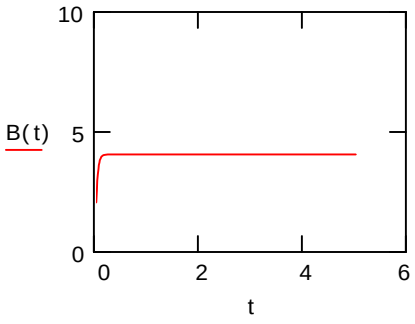
Now we change the values of the constants. But note that the ratio $\frac{k2}{k1 + k2}$ **is the same, so that the equilibrium values are the same.**

$k1 := 10 \qquad k2 := 20$

$$A(t) := \frac{k1 \cdot A0 - k2 \cdot B0}{k1 + k2} \cdot \exp(-(k1 + k2) \cdot t) + \frac{k2}{k1 + k2} \cdot (A0 + B0)$$

$$B(t) := \frac{k2 \cdot B0 - k1 \cdot A0}{k1 + k2} \cdot \exp(-(k1 + k2) \cdot t) + \frac{k1}{k1 + k2} \cdot (A0 + B0)$$





Again we change the values of the constants. But the ratio $\frac{k2}{k1 + k2}$ is still the same, so that the equilibrium values remain unchanged.

$k1 := .1 \qquad k2 := .2$

$$A(t) := \frac{k1 \cdot A0 - k2 \cdot B0}{k1 + k2} \cdot \exp(-(k1 + k2) \cdot t) + \frac{k2}{k1 + k2} \cdot (A0 + B0)$$

$$B(t) := \frac{k2 \cdot B0 - k1 \cdot A0}{k1 + k2} \cdot \exp(-(k1 + k2) \cdot t) + \frac{k1}{k1 + k2} \cdot (A0 + B0)$$