(a)

$$G'(t) = k - rG(t).$$

(b) Consider the homogeneous equation

$$G'(t) = -rG(t).$$

The general solution of this equation is $G(t) = Ce^{-rt}$ where C is an arbitrary constant. It easy to see that a particular solution of the equation $G'(t) = k - rG(t)$ is $G(t) = \frac{k}{r}$. Thus the general solution of the equation $G'(t) = k - rG(t)$ is $G(t) = \frac{k}{r} + Ce^{-rt}$. From the initial condition $G(0) = 0$ we have $C = -\frac{k}{r}$. Finally $G(t) = \frac{k}{r} - \frac{k}{r}e^{-rt}$.

(c) From the general solution formula of the equation $G'(t) = k - rG(t)$ it is easy to see that $\lim\limits_{t\to\infty} G(t) = \frac{k}{r}$ for any initial condition.