(a) Assume the rate of growth of mountain goat is 2% per year. There are currently 1000 goats in a nature reserve. Write a model describing the goat population at time \( t \).

(b) (LGR) A nature reserve can support no more than 4000 mountain goats. Assume the rate of growth is proportional to how close the population is to this maximum, with a growth rate of 2%. There are currently 1000 goats. Write a model describing the goat population at time \( t \).

(c) A nature reserve can support no more than 4000 mountain goats. Assume the growth rate is 2%. There are currently 1000 goats. Write a logistic growth describing the goat population at time \( t \).
2. (LGR) An influenza epidemic spreads at a rate proportional to the product of the number of people infected and the number not yet infected. Assume that 100 people are infected at the beginning of the epidemic in a community of 20,000 people, and 400 are infected 10 days later. Write an equation for the number of people infected, $y$, after $t$ days.