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carrying capacity

logistic growth

Math 1030 #15a

Real Population Growth

growth rate

Population Growth Rate

Population Growth

EX 1: Find the approximate doubling time and estimate the population of the world in 2050, given that the population was 6.8 billion in 2009.

The growth rate has varied over the years. $t = 2050 - 2009$

$t = 41 \text{ yrs}$

need to use:

$T \approx \dfrac{70}{P}$ (to approximate doubling time)

Predict using this formula:

new value = old value $\times 2^{t/T_{double}}$

a) Assume the growth rate is 1.6 % as it was between 1970 and 2000.

$P = 1.6 \Rightarrow T \approx \dfrac{70}{1.6} = 43.75 \text{ yrs}$

$\text{Pop} = 6.8 \left(2^{41/43.75} \right) \approx 13.02 \text{ billion}$

b) Assume the growth rate is 0.7% as it is currently.

$P = 0.7 \Rightarrow T \approx \dfrac{70}{0.7} = 100 \text{ yrs}$ (from 2014)

$\text{Pop} = 6.8 \left(2^{41/100} \right) \approx 9.035 \text{ billion}$

Overall Population Growth Rate

Growth rate = birth rate - death rate

EX 2: Compare the population growth rate of the USA in 1985 and 2005.

Notation: 15.7 in table
means 15.7 births per
1000 people.

year	1985	2005
birth rate/1000	15.7	14.1
death rate/1000	8.7	8.2

1985: growth rate = 15.7 - 8.7
= 7 (per 1000 people)

2005: growth rate = 14.1 - 8.2
= 5.9 (per 1000 people)