Reminder

• DS today, 5:00pm, Scott.

• Please use the link "email instructor" on the bottom of the problem page to send me queries about ww questions. Also, enter your best shot at the answer and leave it there until you hear from me.

More Word Problems

• Problem 46, page 354, updated and modified.

This is a math exercise, not a political statement or prediction!

The Census Bureau estimates that for the next few decades the growth rate \( k \) of the world population will decrease by roughly 0.0002 per year. In 2020, the world population is 7.8 billion, and is growing at 1.1% per year. When will the world population reach its maximum, what will the maximum be, and by what time will it drop back to its 2020 level? (Let’s suppose that the validity of the model stops at that time. Otherwise the model would predict that the human species will become extinct within a few hundred years.)
Figure 1. World Population.

- Figure 1 Shows the population according to model proposed by the textbook, and under the assumption of exponential growth of 1.1%.
• Problem 17, page 358, textbook. A tank initially contains 120 gallons of pure water. Brine with 1 pound of salt per gallon flows into that tank at 4 gallons per minute, and the well-stirred solution runs out at 6 gallons per minute. How much salt is in the tank after $t$ minutes.
Figure 2. Amount of Salt.

- Figure 2 shows the amount of salt in our tank.
• Compute $\int \frac{1}{\sqrt{a^2-x^2}} \, dx$. 
Compute $\int \frac{1}{\sqrt{a^2 + x^2}} \, dx$. 
Compute \( \int \frac{1}{x^2 + 2x + 3} \, dx \).