Calculus I

Modeling Exponential Growth

In 1977 there were approximately 200 Elvis impersonators. Twenty years later in 1997, there were approximately 20,000 Elvis impersonators. The world population in 1987 was approximately 5,113,000,000 and had grown to approximately 5,846,000,000 by 1997. Assume that the world population and the Elvis impersonator population are both growing exponentially.

** Keep at least 5 decimal places when rounding numerical answers. **

1. Let $t = 0$ represent 1997. Find an expression $P(t)$ for the world population at time t.

2. Again, let $t = 0$ represent 1997. Find an expression $E(t)$ for the Elvis impersonator population at time t.

3. Use your function $P(t)$ to predict the world population at the end of 2020.

4. Use your function $E(t)$ to predict the Elvis impersonator population at the end of 2020.

5. When will the world population equal the Elvis impersonator population? In other words, when will everyone on earth be an Elvis impersonator?