

Group Quiz 7 Chapter 4

1. Find the exponential models that pass through each of the following pairs of points. Find an exact model for part (a), and round your constants to 2 decimal places for part (b).

(a) $(0, 5)$ and $(1, 15)$

(b) $(10, 329)$ and $(30, 26)$

2. Recall from lecture on Thursday, that the *half-life* of an exponentially decaying substance is the time it takes for half of the substance to decay. Italy's population right now is decreasing because of low birth rates. In 2002, the population was about 57.7 million. If Italy's population decays exponentially with a half-life of 40 years, answer the following:

(a) What will be Italy's population in the year 2042?

(b) Let $f(t)$ represent Italy's population (in millions) at t years since 2002. Find an equation for f .

(c) Find $f(16)$. What does your result mean in terms of Italy's population?

3. (a) Suppose that \$800 is deposited into a savings account that earns 3% compounded annually. Let $C(t)$ represent the value (in dollars) of the 3% annual compounded interest account at t years after depositing \$800. Find a formula for $C(t)$.
- (b) Now suppose that \$800 is deposited into a savings account that earns 3% simple interest. Recall that *simple interest* means that the interest each year is 3% of the \$800 only. Let $S(t)$ represent the value (in dollars) of the 3% simple interest account at t years after depositing \$800. Find a formula for $S(t)$.
- (c) Find $C(1)$, $C(2)$, $S(1)$, and $S(2)$. Explain in terms of the situation why it makes sense that $C(1) = S(1)$ but $C(2) \neq S(2)$.
- (d) Compare $C(20)$ and $S(20)$. What does your comparison mean in terms of the accounts?