# Chapter 14 – 2a Applications in Business and Economics

**Example 1.** The life expectancy (in years) of a certain brand of clock radio is a continuous random variable with a probability denisty function

A) Find the probability that a randomly selected clock radio lasts at most 6 years.

B) Find the probability that a randomly selected clock radio lasts from 6 to 12 years.

C) Evaluate:

D) Find the time such that the probability of a randomly selected clock radio lasting at most years is 0.8.

The probability that a clock radio will fail within 8 years is 0.8. Put another way, we would expect 80% of the clock radios to fail by the end of 8 years.

Example 2. A manufacturer guarantees a product for 12 months. The time to failure (in months) of the product after it has been sold is given by the probability density function

A) What is the probability that a randomly selected unit will fail during the warranty period?

Approximately 11% of the units sold will fail during the warranty period.

B) What is the probability that a randomly selected unit will fail during the second year?

C) What is the probability that it will be at least 3 years before a randomly selected unit fails?

D) Evaluate

E) How long should the warranty be if an acceptable return rate for warranty repairs is 5% of the units sold?

The warranty period should be about 5.13 months. This is not a standard time frame. If the company offered a 90-day warranty, only about 3% of the units would be returned for warranty repairs.