

Radical Functions in Applied Problems
Section 7.7

OBJECTIVES: To solve “real-life” radical equations.

DIRECTIONS: Discuss and solve the following problems in your groups. Write your solutions neatly on another piece of paper. Due

1. The number of Americans who live alone has been increasing over the past several decades. The increase is due in part to greater acceptance by society of those who live alone, an increase in the divorce rate, as well as people waiting longer to get married. Let $f(t) = 2.6\sqrt{t} + 10.85$ represent the number (in millions) of people who live alone t years after 1970.
 - a. What is the domain of $f(t)$? What is the corresponding range?
 - b. Use the function to predict the number of people who will be living alone in 2003.
 - c. Use the function to predict when 30 million people will be living alone.
 - d. Does $f(t)$ have any t -intercepts? If so, find each one and describe what each represents in terms of people who live alone.

2. A random telephone poll of 400 registered voters determined that 55% would vote to support a tax measure for the library. The number 55% is an estimate and is usually reported with a plus or minus error. The formula for the error is

$$E = \pm 1.96 \sqrt{\frac{p(1-p)}{n}}$$
 where p is the proportion favoring the tax, written as a decimal,

and n is the number of people in the study.

- a. Determine the error for this study.
 - b. Solve the equation for n .
 - c. Use the formula in (b) to find n , the number of people needed in this study if we want an error of at most ± 0.04 .
3. The formula below approximates the volume in hundreds of board feet in a tree that is t years old.
$$V = (5.86 \times 10^{-4}) t^{5/2}$$
 - a. Predict the number of board feet in a tree that is 150 years old.
 - b. How many years will it take to reach a volume of 5000 board feet?