

## Applications of Lines

1. In 1995 the per capita disposable personal income in country **Z** (in dollars) was \$20,200, an amount which has been increasing by approximately \$1100 per year since 1995.
  - A. Find a linear equation that will give the per capita income in **Z** in a given year. Let  $x$  represent the number of years since 1995.
  - B. Estimate the per capita disposable personal income in **Z** in 2001.
  - C. Estimate the per capita disposable personal income in **Z** in 2010.
  - D. Predict the year during which the per capita disposable personal income in **Z** will reach \$40,000.
2. In 1990 the net imports of oil were 7,200,000 barrels in country **Z**, and in 2005 the net imports of oil were 12,300,000 barrels. Assume a linear relationship between the year and the net imports of oil in barrels in **Z**.
  - A. Find a linear equation which will predict the net imports of oil in **Z** for a given year. Let  $x$  represent the number of years since 1990 and  $y$  the net imports of oil in thousands of barrels.
  - B. Estimate the net imports of oil in barrels in the year 2000.
  - C. Predict the net imports of oil in barrels in the year 2010.
  - D. Predict the year in which the net imports of oil will surpass 15,000,000 barrels.
3. The **Z Company** is planning to make a new graphing calculator model. The *fixed costs* to set up production are \$100,000, the *direct costs* for each calculator made are \$50, and each calculator will have a retail price of \$75.
  - A. Find the *cost function*  $C$  for producing  $x$  calculators.
  - B. Find the *revenue function*  $R$  for selling  $x$  calculators.
  - C. Find the *profit function*  $P$  for making and selling  $x$  calculators.
  - D. Determine the number of calculators the company must make and sell in order to *break even*.
  - E. Sketch the graphs of  $C$ ,  $R$ , and  $P$  including the *break-even point*.