

Technology Activity

(Use with Lesson 9-4)

Buying a New Car

You are planning to buy a new car. After months of searching, you fall in love with a car that costs \$12,000. You can afford payments of \$250 per month. You have two options.

1. You can buy the car with a loan at 9% annual interest compounded monthly.
2. You can invest \$250 each month at 5% and pay cash for the car later. (Assume that the price of the car remains constant.)

How long will it take to pay for the car each way?

You can use a TI-82 to model this process. Turn off all stat plots and clear the Y=list. Then press **2nd** **QUIT** to get to the home screen. Store the values of the interest rates as follows.

Enter: **.09** **÷** **12** **STO▶** **ALPHA** **I** **ENTER**

.05 **÷** **12** **STO▶** **ALPHA** **J** **ENTER**

Enter the following formula to describe making the monthly car payments:

$Y_1 = 12000 - 250(1 - (1 + I)^{-X}) / I$. Then enter the following formula to describe investing the money: $Y_2 = 250((1 + J)^X - 1) / J$. Press **2nd** **QUIT** to return to the home screen.

Using a graphing calculator, fill in the blanks.

1. How long will it take to pay off the loan? Use 36 months as a guess, and round to the nearest tenth. **1. 59.7 months**

Enter: **MATH** **0** **2nd** **Y-VARS** **ENTER** **ENTER**

, **X,T,θ** **,** **36** **)** **ENTER**

2. To calculate the total amount you would pay if you got a loan, press **×** **250** **ENTER**, which multiplies the months to pay off the loan by the payment amount. **2. \$14,931.95**

3. How long will it take to save enough money to buy the car outright? Solve Y_2 less \$12,000 for X and round to the nearest tenth. **3. 43.8 months**

Enter: **MATH** **0** **2nd** **Y-VARS** **ENTER** **▼**

ENTER **-** **12000** **,** **X,T,θ** **,** **36** **)** **ENTER**

4. Press **2nd** **TABLE** to examine the amount saved versus the amount still owed for each time period. To examine the amounts graphically, set the viewing window as follows: $X_{min} = 0$, $X_{max} = 47$, $X_{scl} = 12$; $Y_{min} = 0$, $Y_{max} = 12000$, $Y_{scl} = 1000$. Then press **TRACE**. What is the approximate break-even point of the two methods? **4. about 24 months**