

(4-8)
Annuity Payment and
EAR

You want to buy a car, and a local bank will lend you \$20,000. The loan would be fully amortized over 5 years (60 months), and the nominal interest rate would be 12%, with interest paid monthly. What is the monthly loan payment? What is the loan's EFF%?

INTERMEDIATE PROBLEMS

9-29

(4-9)
Present and Future
Values of Single Cash
Flows for Different
Periods

Find the following values, *using the equations*, and then work the problems using a financial calculator to check your answers. Disregard rounding differences. (*Hint*: If you are using a financial calculator, you can enter the known values and then press the appropriate key to find the unknown variable. Then, without clearing the TVM register, you can "override" the variable that changes by simply entering a new value for it and then pressing the key for the unknown variable to obtain the second answer. This procedure can be used in parts b and d, and in many other situations, to see how changes in input variables affect the output variable.)

- An initial \$500 compounded for 1 year at 6%
- An initial \$500 compounded for 2 years at 6%
- The present value of \$500 due in 1 year at a discount rate of 6%
- The present value of \$500 due in 2 years at a discount rate of 6%

(4-10)
Present and Future
Values of Single Cash
Flows for Different
Interest Rates

Use both the TVM equations and a financial calculator to find the following values. See the Hint for Problem 4-9.

- An initial \$500 compounded for 10 years at 6%
- An initial \$500 compounded for 10 years at 12%
- The present value of \$500 due in 10 years at a 6% discount rate
- The present value of \$500 due in 10 years at a 12% discount rate

(4-11)
Time for a Lump Sum
to Double

To the closest year, how long will it take \$200 to double if it is deposited and earns the following rates? [*Notes*: (1) See the Hint for Problem 4-9. (2) This problem cannot be solved exactly with some financial calculators. For example, if you enter $PV = -200$, $PMT = 0$, $FV = 400$, and $I = 7$ in an HP-12C and then press the N key, you will get 11 years for part a. The correct answer is 10.2448 years, which rounds to 10, but the calculator rounds up. However, the HP-10B gives the exact answer.]

- 7%
- 10%
- 18%
- 100%

(4-12)
Future Value of an
Annuity

Find the *future value* of the following annuities. The first payment in these annuities is made at the *end* of Year 1, so they are *ordinary annuities*. (*Notes*: See the Hint to Problem 4-9. Also, note that you can leave values in the TVM register, switch to Begin Mode, press FV, and find the FV of the annuity due.)

- \$400 per year for 10 years at 10%
- \$200 per year for 5 years at 5%
- \$400 per year for 5 years at 0%
- Now rework parts a, b, and c assuming that payments are made at the *beginning* of each year; that is, they are *annuities due*.