Practice problem

Suppose your savings account pays 9% interest compounded quarterly. If you deposit $10,000 for one year, how much would you have at the end of the year?

(a) Interest rate per quarter:

$$i = \frac{9\%}{4} = 2.25\%$$

(b) Annual effective interest rate:

$$i_a = (1 + 0.0225)^4 - 1 = 9.31\%$$

(c) Balance at the end of one year (after 4 quarters)

$$F = \$10,000(F/P, 2.25\%, 4)$$
$$= \$10,000(F/P, 9.31\%, 1)$$
$$= \$10,931$$

Brute force method of solution

First quarter	base amount + interest (2.25%)	$10,000 + $225
Second quarter	= new base amount + Interest (2.25%)	= $10,225 +$230.06
Third quarter	= new base amount + Interest (2.25%)	= $10,455.06 +$235.24
Fourth quarter	= new base amount + interest (2.25 %) = value after one year	= $10,690.30 + $240.53 = $10,930.83

Effective annual interest rate (9% compounded quarterly)

Example 3.4: Calculating auto loan payments