Practice Quiz 6: on Chapter 13 Solutions

[1] (13.1 #9) The expression $F = 3420(1+ (0.025/4))^{(4*3)}$ resulted from substituting certain values into the compound-interest formula. Referring to the expression, find the following:

(a) The principal invested: P = $3420

(b) The annual interest rate: r = 2.5%

(c) The number of compounding periods in a year: m = 4

(d) The future value rounded to the nearest cent: F = $3685.50

[2] (13.1 #19) Which is the best deal over a 3-year period: investing at 5% compounded annually, investing at 4.95% compounded semiannually, or investing at 4.9% compounded monthly? Explain your answer.

Compute the effective annual interest rate in each case. The biggest EAR gives the best deal (whether it's for 1 year, 3 years, or whatever).

5% compounded annually gives an EAR of: $(1+ 0.05)^1 - 1 = 5\%$

4.95% compounded semiannually gives an EAR of: $(1+ 0.0495/2)^2 - 1 = 5.01126\%$

4.9% compounded monthly gives an EAR of: $(1+ 0.049/12)^{12} - 1 = 5.01156\%$

Thus 4.9% compounded monthly is best.

[3] (13.2 #3) Find the finance charge and new balance for the following credit card account:

Previous Balance = $250.23
New Purchases = $245.27
Payments = $175.00
Average Daily Balance = $275.00
Annual Percentage Rate = 18.9%
Billing Period = 30 days

The daily interest rate is 18.9%/365. This is applied for 30 days, giving a rate of 30(18.9%/365) = 1.5534%.
This is applied to the average daily balance of $275.00, giving a finance charge of (0.015534)(275.00) = $4.27.
The new balance is: $250.23 + $245.27 – $175.00 + $4.27 = $324.77.

[4] (13.2 #27) A new sedan costs $19,995. You pay $5000 down and finance the rest for 48 months at 6.25% interest. Find the monthly payment. Explain how you obtain your answer.

Use the formula on p. 825: $PMT = P*(r/12)*(1+r/12)^{12t}/((1+r/12)^{12t} - 1)$, where here P = 19995 - 5000 = 14995, t = 4 and r = 0.0625, giving a payment of PMT = $353.88. You can also use the table on p. 824: use the column for 4 years and the row for 6.25. The table entry is 23.59982. This is the payment for a loan of $1000. Our loan is 14.995 times as much so the payment is (14.995)(23.59982) = $353.88.

[5] In the previous problem, suppose the monthly payment is $336.90. Use the table on p. 824 to estimate what the interest rate is on the loan.

We must divide the given payment of $336.90 by 14.995 to find the table entry: $336.90/14.995 = 22.467489. Looking in the column for 4 year loans, we find that 22.467489 corresponds to a rate of about 3.75%.