Solutions to selected problems from RWJ

André de Souza

May 24, 2007

Chapter 4

1. First Mark pays out $\$\ 5000(1 + (0.06 * 10)) = \$\ 8{,}000$

   First Mullineaux pays out $\$\ 5000(1 + 0.06)^{10} = \$\ 8{,}954.24$

6. Total cost of your child's education is \$300,000 in 18 years.

   Let the rate you have to earn on your initial deposit be x.

   Your account grows to $\$\ 40,000 * (1 + x)^{18}$, which must equal 300,000.

   Therefore, $40,000 * (1 + x)^{18} = 300,000$, or

$$(1 + x)^{18} = \frac{300,000}{40,000}$$

$$x = \left(\frac{300,000}{40,000}\right)^{\frac{1}{18}} - 1 = 11.8445\%$$

7. Calculating number of periods

   To double your money at 9%, one dollar must become two dollars, or we must have that

$$1 * (1 + .09)^t = 2$$

   Take logs on both sides, and observe that $log\,(1.09^t) = t * log(1.09)$, so that

$$t * log(1.09) = log(2)$$

Or,

$$t = 8.043$$

years

11. Lottery

    The present value is

$$\frac{2,000,000}{1.12^{80}} = \$230.98$$

12. Assume the dollars were issued on January 1, 1952. On January 1, 1955, they are three years old. On January 1, 2055, they are 103 years old. If that's when they're sold, then they're worth

$$50 * (1 + 0.0425)^{103} = \$3637.513$$

9. Ferraris

    Starting with $26,000, you want to end up with $120,000, in t years at 3.5%, or,

$$26,000 * (1 + 0.035)^t = 120,000$$

    Again, take logs, so

$$t = \frac{log\left(\frac{120000}{26000}\right)}{log(1.035)} = 44.45$$

    years.

17. Ferraris, continued.

    The equation is

$$x * (1 + 0.115)^{10} = 120000$$

    or,

$$x = \$40,404.76$$

21. If you compound monthly, at the end of the ten years, you have

$$8,000 * (1.01)^{12*10} = \$26,403.1$$

If you compound annually, at the end of the ten years, you have

$$8,000 * (1.12)^{10} = \$24,846.79$$

Notice that you could do the monthly compounding by first finding the EAR, that is,

$$1 + EAR = 1.01^{12} = 1.1268$$

And then using the EAR for the 10 year period, so that

$$8,000 * (1.1268)^{10} = \$26,403.1$$

22. 36 months is six 6-month periods. One dollar, when quadrupled, grows to four, or, if x is the interest rate for six months,

$$\$1 * (1 + x)^6 = \$4$$

implying that $x = 4^{\frac{1}{6}} - 1$, or 25.99%

Again, observe that I could have made this an EAR and solved

$$\$1 * (1 + y)^3 = \$4$$

where y is the EAR.