Problems Chapter 1 - SOLUTIONS

(Note: Some of these problems require the use of the time value of money tables in the chapter appendix, a financial calculator, or spreadsheet software.)

**1.** Using the rule of 72, approximate the following amounts. (LO 1.1)

*a.* If the value of land in an area is increasing 6 percent a year, how long will it take for property values to double?

 **About 12 years (72 / 6)**

*b.* If you earn 10 percent on your investments, how long will it take for your money to double?

 **About 7.2 years (72 / 10)**

*c.* At an annual interest rate of 5 percent, how long will it take for your savings to double?

 **About 14.4 years (72 / 5)**

**2.** In 2019, selected automobiles had an average cost of $16,000. The average cost of those same automobiles is now $20,000. What was the rate of increase for these automobiles between the two time periods? (LO 1.1)

 **($20,000 ‑ $16,000) / $16,000 = .25 (25 percent)**

**3.** A family spends $46,000 a year for living expenses. If prices increase by 3 percent a year for the next three years, what amount will the family need for their living expenses after three years? (LO 1.1)

**46,000  1.09 = $50,140; or using Exhibit 1-A: $46,000  1.093 = $50,278**

**4.** Ben Collins plans to buy a house for $260,000. If the real estate in his area is expected to increase in value by 2 percent each year, what will its approximate value be seven years from now? (LO 1.1)

 **$260,000  1.149 = $298,740; or using Exhibit 1-A: $260,000  1.149 = $298,740**

**5.** What would be the yearly earnings for a person with $9,000 in savings at an annual interest rate of 1.5 percent? (LO 1.3)

 **$9,000  0.015 = $135**

**6.** Using time value of money tables (Exhibit 1–3 or chapter appendix tables), calculate the following. (LO 1.3)

*a.* The future value of $550 six years from now at 7 percent.

**$550  1.501 = $825.55 (Exhibit 1-A)**

*b.* The future value of $900 saved each year for 10 years at 8 percent.

**$900  14.487 = $13,038.30 (Exhibit 1-B)**

*c.* The amount a person would have to deposit today (present value) at a 5 percent interest rate to have $1,000 five years from now.

**$1,000  0.784 = $784 (Exhibit 1-C)**

*d.* The amount a person would have to deposit today to be able to take out $500 a year for 10 years from an account earning 8 percent.

 **$500  6.710 = $3,355 (Exhibit 1-D)**

**7.** If you desire to have $12,000 for a down payment for a house in five years, what amount would you need to deposit today? Assume that your money will earn 4 percent. (LO 1.3)

 **$12,000  0.822 = $9,864 (Exhibit 1-C)**

**8.** Pete Morton is planning to go to graduate school in a program of study that will take three years. Pete wants to have $8,000 available each year for various school and living expenses. If he earns 3 percent on his money, how much must he deposit at the start of his studies to be able to withdraw $8,000 a year for three years? (LO 1.3)

 **$8,000  2.829 = $22,632 (Exhibit 1-D)**

**9.** Carla Lopez deposits $2,800 a year into her retirement account. If these funds have an average earning of 7 percent over the 40 years until her retirement, what will be the value of her retirement account? (LO 1.3)

 **$2,800  199.635 = $558,978 (Exhibit 1-B)**

**10.** If a person spends $10 a week on coffee (assume $500 a year), what would be the future value of that amount over 10 years if the funds were deposited in an account earning 3 percent? (LO 1.3)

 **$500  11.464 = $5,732 (Exhibit 1-B)**

**11.** A financial company that advertises on television will pay you $60,000 now for annual payments of $10,000 that you are expected to receive for a legal settlement over the next 10 years. If you estimate the time value of money at 10 percent, would you accept this offer? (LO 1.3)

**The present value of the annual payment is calculated as: $10,000 X 6.145 = $61,450**

**The $60,000 being offered now is less than the present value of the future flow.**

**12.** Tran Lee plans to set aside $2,600 a year for the next seven years, earning 3 percent. What would be the future value of this savings amount? (LO 1.3)

 **$2,600 X 7.662 = (future value of a series) = $19,921.20 (Exhibit 1-B)**

**13.** If you borrow $8,000 with a 5 percent interest rate to be repaid in five equal payments at the end of the next five years, what would be the amount of each payment? (Note: Use the present value of an annuity table in the chapter appendix.) (LO 1.3)

 **$8,000 / 4.329 = $1,848**

(*Note:* Some of these problems require the use of the time value of money tables in the [Chapter 1 Appendix](file:///G%3A%5CPF-Focus-7e%5CProblem%20solutions%5C96810efbb31246e39b135a40db20fb78), a financial calculator, or spreadsheet software.)