

SOLUTIONS

Foundations of Math - Chapter 8 Exam Review

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- D 1. Determine the future value of a simple interest investment with a 4-year term on a principal of \$400 at 1.9%.
- $$A = P(1 + rt)$$
- $$= \$400 [1 + (0.019)(4)]$$
- $$= \$400(1 + 0.076)$$
- $$= \$400(1.076)$$
- $$= \$430.40$$

- A) \$407.60
 B) \$460.80
 C) \$404.00
 D) \$430.40

- D 2. Principal of \$80 is invested at 2.3% simple interest, paid annually, for 4 years. What is the rate of return?
- $$I = Prt$$
- $$= 80(0.023)(4)$$
- $$= \$7.36$$
- $$FOR = \frac{\text{earn}}{\text{invested}} \times 100$$
- $$= \frac{\$7.36}{\$80} \times 100$$
- $$= 0.092 \times 100$$
- $$= 9.2\%$$

- A) 8.9%
 B) 9%
 C) 8.4%
 D) 9.2%

- B 3. Patrick invested \$4000 for 9 years. At the investment's maturity, its value was \$5476. What was the annual simple interest rate?
- $$I = A - P$$
- $$I = \$5476 - \$4000$$
- $$I = \$1476$$
- $$I = Prt$$
- $$\$1476 = \$4000(r)(9)$$
- $$\frac{\$1476}{36000} = \frac{36000r}{36000}$$
- $$0.041 = r$$
- $$\frac{\$1476}{36000} = 4.1\%$$

- A) 3.8%
 B) 4.1%
 C) 6.2%
 D) 5.3%

- B 4. Rosa invested \$600 at 3.9% simple interest. At the investment's maturity, its value was \$1302. How long was the money invested?
- $$I = A - P$$
- $$I = \$1302 - \$600$$
- $$I = \$702$$
- $$I = Prt$$
- $$\$702 = \$600(0.039)(t)$$
- $$\frac{\$702}{234} = \frac{234t}{234}$$
- $$30 = t$$

- A) 25 years
 B) 30 years
 C) 35 years
 D) 40 years

- A 5. Which investment will earn the most interest?
- A. \$500 invested for 8 years at a compound interest rate of 3.5%
 B. \$800 invested for 3 years at a simple interest rate of 5%
 C. \$1000 invested for 4 years at a compound interest rate of 1.75%
 D. \$500 invested for 8 years at a simple interest rate of 3.6%
- $$A) A = P(1 + \frac{r}{n})^{nt}$$
- $$= \$500(1 + \frac{0.035}{1})^{(1)(8)}$$
- $$= \$658.40$$
- $$I = A - P$$
- $$= \$658.40 - \$500.00$$
- $$= \$158.40$$
- B) Option B
 C) Option C
 D) Option D
- $$C) A = P(1 + \frac{r}{n})^{nt}$$
- $$= \$1000(1 + \frac{0.0175}{1})^{(1)(4)}$$
- $$= \$1071.86$$
- $$I = A - P$$
- $$= \$1071.86 - \$1000$$
- $$= \$71.86$$

B)

D

6. How many compounding periods are there for \$850 invested for 10 years at 4.75% compounded quarterly?

$$\begin{aligned}
 A &= P \left(1 + \frac{r}{n}\right)^{nt} \\
 &= \$850 \left(1 + \frac{0.0475}{4}\right)^{(4)(10)} \\
 &= \$850 \left(1 + \frac{0.0475}{4}\right)^{40} \quad \text{Total \# of compounding periods.}
 \end{aligned}$$

- A) 2.5
- B) 10
- C) 30
- D) 40

A 7. Determine the future value and the total interest earned for the investment.

Principal (P) (\$)	Compound Interest Rate per Annum (%)	Compounding Frequency	Term
16 000	5.4	monthly	4.5 years

$$\begin{aligned}
 A) & \$20\,389.98; \$4389.98 \\
 B) & \$19\,848.02; \$3848.02 \\
 C) & \$20\,398.53; \$4398.53 \\
 D) & \$20\,956.50; \$4956.50
 \end{aligned}$$

$$\begin{aligned}
 A &= P \left(1 + \frac{r}{n}\right)^{nt} \\
 &= \$16\,000 \left(1 + \frac{0.054}{12}\right)^{(12)(4.5)} \\
 &= \$16\,000 \left(1 + \frac{0.054}{12}\right)^{54} \\
 &= \$20\,389.98
 \end{aligned}$$

$$\begin{aligned}
 I &= A - P \\
 &= \$20\,389.98 - \$16\,000 \\
 &= \$4389.98
 \end{aligned}$$

Short Answer

- Determine the difference in the interest earned at maturity on these two investments. Who earned the most interest?
 - Noor invested \$6000 in a GIC for a term of 6 years with a simple interest rate of 6%, paid annually.
 - Midori invested \$6000 in a GIC for a term of 6 years with a compound interest rate of 6%, paid annually.

Noor

$$\begin{aligned}
 A &= P(1 + rt) \\
 &= \$6000[1 + (0.06)(6)] \\
 &= \$6000(1 + 0.36) \\
 &= \$6000(1.36) \\
 &= \$8160
 \end{aligned}$$

$$\begin{aligned}
 I &= A - P \\
 &= \$8160 - \$6000 \\
 &= \$2160
 \end{aligned}$$

Midori

$$\begin{aligned}
 A &= P \left(1 + \frac{r}{n}\right)^{nt} \\
 &= \$6000 \left(1 + \frac{0.06}{1}\right)^{(1)(6)} \\
 &= \$8511.11
 \end{aligned}$$

$$\begin{aligned}
 I &= A - P \\
 &= \$8511.11 - \$6000 \\
 &= \$2511.11
 \end{aligned}$$

$$\begin{aligned}
 & \$8511.11 - \$8160 \quad \underline{\underline{OR}} \quad \$2511.11 - \$2160 \\
 &= \$351.11 \quad \underline{\underline{OR}} \quad = \$351.11
 \end{aligned}$$

Midori earned the most interest.