

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

$$\begin{aligned} A &= P(1+rt) \\ &= \$400 [1+(0.019)(4)] \\ &= \$400 (1+0.076) \\ &= \$400 (1.076) \\ &= \$430.40 \end{aligned}$$

D

2. Principal of \$80 is invested at 2.3% simple interest, paid annually, for 4 years. What is the rate of return?

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

$$\begin{aligned} I &= Prt \\ &= 80(0.023)(4) \\ &= \$7.36 \end{aligned}$$

$$\begin{aligned} ROR &= \frac{\text{earn}}{\text{invested}} \times 100 \\ &= \frac{\$7.36}{\$80} \times 100 \\ &= 0.092 \times 100 \\ &= 9.2\% \end{aligned}$$

Solutions to Chapter 8 Exam Review.notebook

B

3. Patrick invested \$4000 for 9 years. At the investment's maturity, its value was \$5476. What was the annual simple interest rate?

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

$$I = A - P$$

$$I = \$5476 - \$4000$$

$$I = \$1476$$

$$I = Prt$$

$$\$1476 = \$4000(r)(9)$$

$$\frac{\$1476}{36000} = \frac{36000r}{36000}$$

$$0.041 = r$$

$$\downarrow$$

$$4.1\%$$

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?

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

$$I = A - P$$

$$I = \$1302 - \$600$$

$$I = \$702$$

$$I = Prt$$

$$\$702 = \$600(0.039)(t)$$

$$\frac{\$702}{23.4} = \frac{23.4t}{23.4}$$

$$30 = t$$

D

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) Option A
 (B) Option B
 (C) Option C
 (D) Option D

$$\begin{aligned} \text{A) } A &= P \left(1 + \frac{r}{n}\right)^{nt} \\ &= \$500 \left(1 + \frac{0.035}{1}\right)^{(1)(8)} \\ &= \$658.40 \\ I &= A - P \\ &= \$658.40 - \$500.00 \\ &= \$158.40 \end{aligned}$$

$$\begin{aligned} \text{B) } A &= P(1 + rt) \\ &= \$800 [1 + (0.05)(3)] \\ &= \$920 \\ I &= \$920 - \$800 \\ &= \$120 \end{aligned}$$

$$\begin{aligned} \text{C) } A &= P \left(1 + \frac{r}{n}\right)^{nt} \\ &= \$1000 \left(1 + \frac{0.0175}{1}\right)^{(1)(4)} \\ &= \$1071.86 \\ I &= A - P \\ &= \$1071.86 - \$1000 \\ &= \$71.86 \end{aligned}$$

$$\begin{aligned} \text{D) } A &= P(1 + rt) \\ &= \$500 [1 + (0.036)(8)] \\ &= \$644 \\ I &= \$644 - \$500 \\ &= \$144 \end{aligned}$$

D

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

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

$$\begin{aligned} A &= P \left(1 + \frac{r}{n} \right)^{nt} \\ &= \$850 \left(1 + \frac{0.0475}{4} \right)^{(4)(10)} \\ &= \$850 \left(1 + \frac{0.0475}{4} \right)^{40} \end{aligned}$$

↑ Total # of compounding periods.

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

- A) \$20 389.98; \$4389.98
 B) \$19 848.02; \$3848.02
 C) \$20 398.53; \$4398.53
 D) \$20 956.50; \$4956.50

$$\begin{aligned}
 A &= P \left(1 + \frac{r}{n}\right)^{nt} \\
 &= \$16\,000 \left(1 + \frac{0.054}{12}\right)^{(12)(4.5)} \\
 &= \$16\,000 \left(1 + \frac{0.054}{12}\right)^{54} \\
 &= \$20\,389.98 \\
 I &= A - P \\
 &= \$20\,389.98 - \$16\,000 \\
 &= \$4\,389.98
 \end{aligned}$$

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Short Answer

1. 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

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

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

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

Midori earned the most interest.