Section 7.3 – Practice Problems

Given the information provided, solve for Interest

1. \( P = $4500 \quad r = 12\% \quad t = 3 \text{ yrs} \quad I = ? \)

\[
I = Prt \\
I = 4500 \cdot 0.12 \cdot 3 \\
= $1620
\]

2. \( P = $12250 \quad r = 6.2\% \quad t = 6 \text{ mnths} \quad I = ? \)

\[
I = Prt \\
12250 \cdot 0.062 \cdot \frac{1}{2} \\
I = 379.75
\]

3. \( P = $47200 \quad r = 3\% \quad t = 5 \text{ yrs} \quad I = ? \)

\[
I = Prt \\
I = 47200 \cdot 0.03 \cdot 5 \\
= $7080
\]

4. \( P = $200 \quad r = 28\% \quad t = 6 \text{ yrs} \quad I = ? \)

\[
I = 200 \cdot 0.28 \cdot 6 \\
= $336
\]

Given the information provided, solve for the missing value

5. \( P = ? \quad r = 7.5\% \quad t = 4 \text{ yrs} \quad I = $150.30 \)

\[
I = Prt \implies P = \frac{I}{rt} \\
P = \frac{150.30}{0.075 \cdot 4} = 4016
\]

6. \( P = $4800 \quad r = ? \quad t = 4 \text{ mnths} \quad I = $12 \)

\[
I = Prt \implies r = \frac{I}{Pt} \\
r = \frac{12}{(4800)(\frac{1}{3})} = 0.0075 \\
r = 0.75\%
\]

7. \( P = $2500 \quad r = ? \quad t = 5 \text{ yrs} \quad I = $675 \)

\[
r = \frac{I}{Pt} \\
r = \frac{675}{2500 \cdot 5} \\
r = 0.054 \\
r = 5.4\%
\]

8. \( P = $1250000 \quad r = 8\% \quad I = $400000 \quad t = ? \)

\[
t = \frac{I}{Pr} \\
t = \frac{400000}{1250000 \cdot 0.08} = 4 \text{ yrs}
\]

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9. What amount will an account have after 4 years, if $7500 is invested at an annual rate of 8% compounded daily?

\[ A = P \left(1 + \frac{r}{n}\right)^{nt} \]

\[ A = 7500 \left(1 + \frac{0.08}{365}\right)^{365 \times 4} \]

\[ A = \$10,328.10 \]

10. An investment opportunity of $50,000 for 10 years has two options: the first pays 11% compounded quarterly, the second pays 9% compounded monthly. Which is the better investment, and by how much?

1. \[ A = 10,000 \left(1 + \frac{0.11}{4}\right)^{4 \times 10} = \$29,598.74 \] Better.

2. \[ A = 10,000 \left(1 + \frac{0.09}{12}\right)^{12 \times 10} = \$24,513.57 \]

11. How much was Lily’s loan if she must pay back $500 in 6 months and $1000 at the end of one year, if the loan was at 8% compounded quarterly?

\[ 500 = P_1 \left(1 + \frac{0.08}{4}\right)^{4 \times (\frac{1}{2})} \rightarrow P_1 = \frac{500}{\left(1.02\right)^2} = \$480.58 \]

\[ 1000 = P_2 \left(1 + \frac{0.08}{4}\right)^{4 \times 1} \rightarrow P_2 = \frac{1000}{\left(1.02\right)^4} = \$923.85 \]

Loan: \$480.58 + \$923.85 = \$1404.43

12. John started an RRSP on January 1st, 2013, with a deposit of $2500. He added $1500 on January 1st, 2014, and $2000 on January 1st, 2015. What is the accumulated value of his account on January 1st, 2016, if the interest is compounded quarterly?

\[ A_1 = 2500 \left(1 + \frac{0.06}{4}\right)^{4 \times 3} = 2653.41 \] odd $1500

\[ A_2 = 4153.41 \left(1 + \frac{0.06}{4}\right)^{4 \times 2} = 4408.28 \] odd $2000

\[ A_3 = 6408.28 \left(1 + \frac{0.06}{4}\right)^{4 \times 1} = \$6801.51 \]
13. Steve makes $120,000 annually, calculate his deductions from his semi-monthly paycheques.

\[
120,000 \div 24 = \frac{5,000}{\text{paycheck}}
\]

CPP: 4.95
EI: 1.66
Income: 26.10
\[5,000 \times 0.3271 = 1,635.50 \text{ in deductions}\]

14. Solace makes $2,450 Gross income bi-weekly, what is her annual salary? Use that info to calculate her deductions for her Net pay.

\[2450 \times 26 = 63,700 \text{ Annually}\]

CPP: 4.95
EI: 1.66
Income: 18.40
\[
\text{Annual Net: } 63,700 - 0.2501 = 15,931.37
\]
\[63700 - 15931.37 = 47,768.63\]

\[
\text{Paycheck Net: } 2450 \times 0.2501 = 612.75
\]
\[2450 - 612.75 = 1837.25\]

15. If Simon had a deduction percentage of 27.2% what are the boundaries of his salary? Pick any annual salary in-between the boundaries and calculate the deductions and bi-weekly Net salary.

\[\text{Boundaries are } 130,000 - 140,000\]

Answers will vary
16. If Houssam has a semi-monthly Gross pay of $5400, what is his annual salary and then calculate his deductions from his paycheck. What is his Net pay semi-monthly?

\[
5400 \times 24 = 129600 \text{ Annually}
\]

\[
\text{EI} = 1.66
\]
\[
\text{CPP} = 4.95
\]
\[
\text{Income} = 26.10
\]
\[
\text{Total} = 32.71
\]

\[
129600 \times 0.3271 = 42392.16
\]

\[
129600 - 42392.16 = 87207.84
\]

\[
87207.84 \div 24 = \Box 3633.66
\]

17. Come up with your own question, make it as challenging as you can and then answer it.

Answers Vary