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NCERT Class 8 Mathematics Solutions: Chapter 8 - Comparing Quantities Exercise 8.3 Part 1
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- If the interest is calculated on yearly basis,

$$
A=P\left(1+\frac{R}{100}\right)^{N}
$$

- Where $\mathrm{A}=$ Amount
$\mathrm{P}=$ Principal
$\mathrm{R}=$ Rate per interest
$\mathrm{N}=$ No. of years.
Question: 1 Calculate the amount and compound interest on:
(a) ₹ 10,800 for 3 years at $12 \frac{1}{2} \%$ per annum compounded annually.
(b) ₹ 18,000 for $\quad 2 \frac{1}{2}$ years at $10 \%$ per annum compounded annually.
(c) ₹ 62,500 for ${ }_{1} \frac{1}{2}$ years at $8 \%$ per annum compounded annually.
(d) ₹ 8,000 for 1 year at $9 \%$ per annum compounded half yearly (You could the year by year calculation using S. I. formula to verify).
(e) ₹ 10,000 for 1 year at $8 \%$ per annum compounded half yearly.

Answer:
(a) Given, Principal $(P)=₹ 10,800$, Time $(n)=3$ year, Rate of Interest $(R)=12 \frac{1}{2}=\frac{25}{2} \%$

Amount (A) $=P\left(1+\frac{R}{100}\right)^{n}$

$$
\begin{aligned}
& =10,800\left(1+\frac{25}{100 \times 2}+3\right. \\
& =10,800\left(1+\frac{1}{8}\right)^{3} \\
& =10,800\left(\frac{9}{8}\right)^{3} \\
& 1350 \\
& =\frac{10,800}{1} \times\left(\frac{9}{8} \times \frac{9}{8} \times \frac{9}{8}\right) \\
& =\frac{984150}{64} \\
& =15,377.34
\end{aligned}
$$

Compound Interest (C.I) $=A-P=$ ₹. $15377.34-₹ .10800$

$$
=₹ .4,577.34
$$

(b) Given,

Principal $(P)=₹ 18,000$, Time $(n)=2 \frac{1}{2}=\frac{5}{2}$ year, Rate of Interest $(R)=10 \%$
Amount $(\mathrm{A})=P\left(1+\frac{R}{100}\right)^{n}$

$$
\begin{aligned}
& =18,000\left(1+\frac{R}{100}\right)^{n} \\
& =18,000\left(1+\frac{10}{100}\right)^{2} \\
& =18,000\left(\frac{110}{100}\right)^{2} \\
& =18,000 \times \frac{110}{100} \times \frac{110}{100} \\
& =₹ 21,780
\end{aligned}
$$

Interest for $\frac{1}{2}$ years on ₹ 21,780 at rate of $10 \%=\frac{1}{2} \times \frac{21780 \times 10 \times 1}{100}=₹ .1089$
Total amount for $2 \frac{1}{2}$ years $=₹ .21,780+₹ .1089=₹ .22,869$
Compound Interest (C. I.) $=A-P=₹ .22869-₹ .18000$

$$
=₹ .4869
$$

(c) Given,

Principal $(P)=₹ 62,500$, Time $(n)=1 \frac{1}{2}=\frac{3}{2}$ years year, Rate of Interest $(R)=8 \%$
Rate of interest = half of $8 \%=4 \%$ half yearly. $n=\frac{3}{2}$ years $=3$ half year

Amount (A) $=P\left(1+\frac{R}{100}\right)^{n}$

$$
\left.\begin{array}{l}
=62500\left(1+\frac{4}{100}\right. \\
25
\end{array}\right)^{3} .
$$

Compound Interest (C.I) $=A-P=₹ .70304-62500$

$$
=₹ .7804
$$

(d) Given,

Principal $(P)=₹ 8,000$, Time $(n)=1$ years $=2$ half-years (compounded half yearly), Rate of Interest $(\mathrm{R})=9 \%=\frac{9}{2} \%$ (compounded half yearly)
$\operatorname{Amount}(\mathrm{A})=P\left(1+\frac{R}{100}\right)^{n}$

$$
\begin{aligned}
& =8000\left(1+\frac{R}{100}\right)^{2} \\
& =8000\left(1+\frac{9}{100 \times 2}\right)^{2} \\
& =8000\left(1+\frac{9}{200}\right)^{2} \\
& =8000\left(\frac{209}{200}\right)^{2} \\
& =8000 \times \frac{209}{200} \times \frac{209}{200} \\
& =8736.2
\end{aligned}
$$

Compound Interest (C.I) $=A-P=₹ .8736 .20-₹ .8000=₹ .736 .20$
(e) ₹ 10,000 for 1 year at $8 \%$ per annum compounded half yearly.

2 half years in one year.
Principal (P) . ₹ 10,000, Time (n) = 1 years, Rate of Interest (R) $=8 \%$
$\operatorname{Amount}(\mathrm{A})=P\left(1+\frac{R}{100}\right)^{n}$

$$
\begin{aligned}
& =10,000\left(1+\frac{4}{100}\right)^{2} \\
& =10000\left(1+\frac{1}{25}\right)^{2} \\
& =10000\left(\frac{26}{25}\right)^{2} \\
& =10000 \times \frac{26}{25} \times \frac{26}{25} \\
& =₹ .10,816
\end{aligned}
$$

Compound Interest (C.I) $=A-P=₹ .10,816-₹ .10,000=₹ .816$

