NCERT Solutions for class 8 maths chapter 8 comparing quantities Ex-8.3

Q1. Calculate the amount and compound interest on:

(a) Rs.10,800 for 3 years at $12\frac{1}{2}\%$ per annum compounded annually.

(b) Rs.18,000 for $2\frac{1}{2}$ years at 10% per an1.

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(b) Rs.18,000 for $2\frac{1}{2}$ years at 10% per annum compounded annually.

(c) Rs.62,500 for $1\frac{1}{2}$ years at 8% per annum compounded annually.

(d) Rs.8,000 for 1 years at 9% per annum compounded half yearly. (You could the year by year calculation using S.I. formula to verify).

(e) Rs.10,000 for 1 years at 8% per annum compounded half yearly.

Ans. (a) Here, Principal (P) = Rs. 10800, Time (n) = 3 years,

Rate of interest (R) $= 12\frac{1}{2}\% = \frac{25}{2}\%$

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

$$= 10800\left(1+\frac{25}{2\times100}\right)^3 = 10800\left(1+\frac{1}{2\times4}\right)^3$$

$$= 10800\left(1+\frac{1}{8}\right)^3 = 10800\left(\frac{9}{8}\right)^3$$

$$= 10800\times\frac{9}{8}\times\frac{9}{8}\times\frac{9}{8}$$

= Rs. 15,377.34

Compound Interest (C.I.) = A – P

= Rs. 10800 – Rs. 15377.34 = Rs. 4,577.34

(b) Here, Principal (P) = Rs. 18,000, Time $(n) = 2\frac{1}{2}$ years, Rate of interest (R)

= 10% p.a.

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

$$= 18000\left(1+\frac{10}{100}\right)^2 = 18000\left(1+\frac{1}{10}\right)^2$$

$$= 18000\left(\frac{11}{10}\right)^2 = 18000\times\frac{11}{10}\times\frac{11}{10}$$

= Rs. 21,780

Interest for $\frac{1}{2}$ years on Rs. 21,780 at rate of 10% = $\frac{21780\times10\times1}{100}$ = Rs. 1,089

Total amount for $2\frac{1}{2}$ years

= Rs. 21,780 + Rs. 1089 = Rs. 22,869

Compound Interest (C.I.) = A – P

= Rs. 22869 – Rs. 18000 = Rs. 4,869

(c) Here, Principal (P) = Rs. 62500, Time $(n) = 1\frac{1}{2} = \frac{3}{2}$ years = 3 years (compounded half yearly)

Rate of interest (R) = 8% = 4% (compounded half yearly)

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

$= 62500\left(1+\frac{4}{100}\right)^2$

$= 62500\left(1+\frac{1}{25}\right)^3$

$= 62500\left(\frac{26}{25}\right)^3$

$= 62500\times\frac{26}{25}\times\frac{26}{25}\times\frac{26}{25}$

= Rs. 70,304

Compound Interest (C.I.) = A – P

= Rs. 70304 – Rs. 62500 = Rs. 7,804

(d) Here, Principal (P) = Rs. 8000, Time $(n) = 1$ years = 2 years(compounded half yearly)

Rate of interest (R) = 9% = $\frac{9}{2}$% (compounded half yearly)

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

$= 8000\left(1+\frac{9}{2\times100}\right)^2$

$= 8000\left(1+\frac{9}{200}\right)^2$

$= 8000\left(\frac{209}{200}\right)^2$

$= 8000\times\frac{209}{200}\times\frac{209}{200}$

= Rs. 8,736.20

Compound Interest (C.I.) = A – P

= Rs. 8736.20 – Rs. 8000

= Rs. 736.20

(e) Here, Principal (P) = Rs. 10,000, Time (n) = 1 years = 2 years (compounded half yearly)

Rate of interest (R) = 8% = 4% (compounded half yearly)

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

$$= 10000\left(1+\frac{4}{100}\right)^2$$

$$= 10000\left(1+\frac{1}{25}\right)^2$$

$$= 10000\left(\frac{26}{25}\right)^2$$

$$= 10000\times\frac{26}{25}\times\frac{26}{25}$$

= Rs. 10,816

Compound Interest (C.I.) = A – P

= Rs. 10,816 – Rs. 10,000 = Rs. 816

Q2. Kamala borrowed Rs.26,400 from a Bank to buy a scooter at a rate of 15% p.a. compounded yearly. What amount will she pay at the end of 2 years and 4 months to clear the loan?

(Hint: Find A for 2 years with interest is compounded yearly and then find SI on the 2nd year amount for $\frac{4}{12}$ years).

Ans. Here, Principal (P) = Rs. 26,400, Time $(n) = 2$ years 4 months, Rate of interest (R) = 15% p.a.

Amount for 2 years (A) = $P\left(1+\frac{R}{100}\right)^n$

$$= 26400\left(1+\frac{15}{100}\right)^2 = 26400\left(1+\frac{3}{20}\right)^2$$

$= 26400\left(\frac{23}{20}\right)^2 = 26400 \times \frac{23}{20} \times \frac{23}{20}$

= Rs. 34,914

Interest for 4 months = $\frac{4}{12} = \frac{1}{3}$ years at the rate of 15% = $\frac{34914 \times 15 \times 1}{100}$

= Rs. 1745.70

∴ Total amount = Rs. 34,914 + Rs. 1,745.70

= Rs. 36,659.70

Q3. Fabina borrows Rs.12,500 per annum for 3 years at simple interest and Radhaborrows the same amount for the same time period at 10% per annnum, compounded annually. Who pays more interest and by how much?

Ans. Here, Principal (P) = Rs.12,500, Time $(T) = 3$ years, Rate of interest (R)

= 12% p.a.

Simple Interest for Fabina = $\frac{P \times R \times T}{100}$

$= \frac{12500 \times 12 \times 3}{100}$ = Rs. 4,500

Amount for Radha, P = Rs. 12,500, R = 10% and n = 3 years

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

$$= 12500\left(1+\frac{10}{100}\right)^3 = 12500\left(1+\frac{1}{10}\right)^3$$

$$= 12500\left(\frac{11}{10}\right)^3 = 12500\times\frac{11}{10}\times\frac{11}{10}\times\frac{11}{10}$$

$= \text{Rs. } 16{,}637.50$

$\therefore$ C.I. for Radha $= A - P$

$= \text{Rs. } 16{,}637.50 - \text{Rs. } 12{,}500 = \text{Rs. } 4{,}137.50$

Here, Fabina pays more interest

$= \text{Rs. } 4{,}500 - \text{Rs. } 4{,}137.50 = \text{Rs. } 362.50$

Q4. I borrowsRs. 12,000 from Jamshed at 6% per annum simple interest for 2 years. Had I borrowed this sum at 6% per annum compound interest, what extra amount would I have to pay?

Ans. Here, Principal (P) = Rs.12,000, Time $(T) = 2$ years, Rate of interest (R) = 6% p.a.

$$\text{Simple Interest} = \frac{P\times R\times T}{100}$$

$$= \frac{12000\times 6\times 2}{100} = \text{Rs. } 1{,}440$$

Had he borrowed this sum at 6% p.a., then

$$\text{Compound Interest} = P\left(1+\frac{R}{100}\right)^n - P$$

$$= 12000\left(1+\frac{6}{100}\right)^2 - 12000$$

$= 12000\left(1+\frac{3}{50}\right)^2 - 12000$

$= 12000\left(\frac{53}{50}\right)^2 - 12000$

$= 12000 \times \frac{53}{50} \times \frac{53}{50} - 12000$

= Rs. 13,483.20 – Rs. 12,000

= Rs. 1,483.20

Difference in both interests

= Rs. 1,483.20 – Rs. 1,440.00 = Rs. 43.20

Q5. Vasudevan invested Rs.60,000 at an interest rate of 12% per annum compounded half yearly. What amount would he get:

(i) after 6 months?

(ii) after 1 year?

Ans. (i) Here, Principal (P) = Rs. 60,000,

Time (n) = 6 months = 1 year(compounded half yearly)

Rate of interest (R) = 12% = 6% (compounded half yearly)

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

$= 60000\left(1+\frac{6}{100}\right)^1$

$$= 60000\left(1+\frac{3}{50}\right)^{1}$$

$$= 60000\left(\frac{53}{50}\right)^{1}$$

$$= 60000\times\frac{53}{50}$$

= Rs. 63,600

After 6 months Vasudevan would get amount Rs. 63,600.

(ii) Here, Principal (P) = Rs. 60,000,

Time (n) = 1 year = 2 year(compounded half yearly)

Rate of interest (R) = 12% = 6% (compounded half yearly)

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

$$= 60000\left(1+\frac{6}{100}\right)^{2}$$

$$= 60000\left(1+\frac{3}{50}\right)^{2}$$

$$= 60000\left(\frac{53}{50}\right)^{2}$$

$$= 60000\times\frac{53}{50}\times\frac{53}{50}$$

= Rs. 67,416

After 1 year Vasudevan would get amount Rs. 67,416.

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