- **Practice:**
  1. Find the compound interest on Rs. 10,000 in 2 years at 4% per annum, the interest being compounded half-yearly.
  2. Find compound interest on Rs. 7500 at 4% per annum for 2 years, compounded annually.
  3. In what time will Rs. 1000 become Rs. 1331 at 10% per annum compounded annually?
  4. What will be the compound interest on a sum of Rs.25,000 after 3 years at the rate of 12 p.c.p.a?
  5. A sum of Rs. 12,500 amounts to Rs. 15,500 in 4 years at the rate of simple interest. What is the rate of interest?

6. How much Simple Interest can a person get on Rs. 8,200 at 17.5% p.a. for a period of 2 years and 6 months?

7. If the principal amount to be 10000 invested in a bank for 3 years with a rate of interest of 10%.What will be the difference of SI & CI?

8. If the principal amount to be 20000 invested in a bank for 3 years with a rate of interest of 20%.What will be the difference of SI & CI?

9. The compound interest on Rs. 30,000 at 7% per annum is Rs. 4347. The period (in years) is:

Problem

1) Ans:- Given, $P = Rs\ 10,000$

$$n = 2\ yrs$$

$$R = 4\%\ per\ annum$$

$$\therefore Amount = P\left(1 + \frac{R/2}{100}\right)^{2n}$$

$$= 10,000\left(1 + \frac{4/2}{100}\right)^{2\times2}$$

$$= 10,000\left(1 + \frac{2}{100}\right)^{4}$$

$$= 10,000\left(\frac{102}{100}\right)^{4}$$

$$\Rightarrow 10,000 \times (1.02)^4$$

$$\Rightarrow 10,000 \times 1.0824 = \underline{\underline{216,824}}$$

2Ans:- Given $P = ₹ 75,000$
$$R = 4 \% \text{ per annum}$$
$$n = 2 \text{ yrs}.$$

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

$$= 75,000\left(1 + \dfrac{4}{100}\right)^2$$

$$= 75,000\left(\dfrac{104}{100}\right)^2$$

$$= 75,000 \, (1.04)^2$$

$$= 75,000 \, (1.0816)$$

$$= ₹ 81,120 //$$

3Ans:- Given, $A = $ Final amount
$$= ₹ 1331$$
$$P = \text{Principal amount}$$
$$= ₹ 1000$$

$$R = 10 \% \text{ per annum}$$
$$t = \text{time in years} \Rightarrow n$$

∴ Amount $= P\left(1 + \dfrac{R}{100}\right)^t$

$$1831 = 1000\left(1 + 10/100\right)^t$$

$$1.331 = 1000 \, (1.1)t$$

$$\frac{1331}{1000} = 1.1^t$$

$$1.331 = (1.1)^t$$

Now; by comparing powers:

$$(1.1)^3 = (1.1)^t$$

$$\Rightarrow \boxed{t = 3} \text{ years.}$$

4 Ans:- Given, $P = 25000$ (principal)

$$r = 12\% \text{ per annum}$$

$$t = 3 \text{ years}$$

$$\therefore A = p\left(1 + \frac{r}{100}\right)^t$$

$$= 25000\left(1 + \frac{12}{100}\right)^3$$

$$= 25000\left(\frac{112}{100}\right)^3$$

$$= 25000\,(1.12)^3 = 25000 \times \overset{1.404\varnothing}{(}$$

$$= ₹35,123.2$$

$\therefore CI = A - P$

$= 35,123.2 - 25000 = \overline{10,1232}$

5Ans:- Given, $P = 12500$

$A = 15500$

$T = 4 yrs.$

$R = ?$

using SI formula:

① $\Rightarrow$ $SI = A - P = 15500 - 12500$

$= 3000$

② $\Rightarrow$ $SI = \dfrac{PTR}{100}$

$3000 = \dfrac{12500 \times 4 \times R}{100}$

$300000 = 12500 \times 4 \times R$

$\begin{array}{r} 12500 \\ \underline{\quad 4} \\ 50000 \end{array}$

$300000 = 50000 \times R$

$\dfrac{300000}{50000} = R$

$\boxed{R = 6 \%}$

6Ans'- Given. $P = RS \ 8,200$

$R = 17.5\%$

$T = 2 \ years \ \& \ 6 \ months$

$= 2\frac{1}{2} = 2.5 \ years$

$$SI = \frac{8200 \times 17.5 \times 2.5}{100}$$

$$= ₹3587.50$$

7Ans'- Given, $P = ₹10000$

$T = 3 \ years$

$R = 10\%$

(i) $SI = \frac{P \times T \times R}{100}$

$$= \frac{10000 \times 3 \times 10}{100}$$

$$= ₹3000$$

$\frac{300}{10}$

(ii) $CI = P\left(1 + \frac{R}{100}\right)^T$

$$= 10000\left(1 + \frac{10}{100}\right)^3$$

$$= 10000\left(\frac{110}{100}\right)^3$$

$$= 10000(1.10)^3 = 13,310$$

$Diff = 13,310 - 3000 = 10,310$

$$(\text{or}).$$

$$\text{Sum} = \frac{\text{difference} \times 100^3}{R^2(300+R)}$$

$$= \frac{10,310 \times 100^3}{(10)^2(300+10)}$$

$$= \frac{10310000000}{100(310)}$$

$$= \frac{10310000000}{31000} = 332580$$

8Ans:- Given, $P = ₹20000$

$$R = 20\%$$
$$T = 3 \text{ years}.$$

(i) $SI = \frac{P \times T \times R}{100} = \frac{20000 \times 3 \times 20}{100}$

$$= ₹12000$$

(ii) $CI = P\left(1 + \frac{R}{100}\right)^T$

$$= 20000\left(1 + \frac{20}{100}\right)^3$$

$$= 20000 \left(\frac{1 \cdot 20}{100} \right)^3$$

$$= 20000 \ (1 \cdot 20)^3 = 1 \cdot 728 \times 20000$$
$$= 34,560$$

$$Diff = 34,560 - 12000$$
$$= 22,560 \text{//}$$

$$Sum = \frac{22,560 \times 100^3}{20^2 \times (300 + 20)}$$

$$= \frac{\overset{705}{\cancel{22560}} \times \overset{250}{\cancel{1000000}}}{\underset{1}{\cancel{400}} \times \underset{1}{(\cancel{320})}}$$

$$= 1,76,250 \text{//}$$

9Ans:— Given, $C \cdot I = Rs \ 4347$
$$P = ₹ 30,000$$
$$R = 7°\text{/o}$$
$$T = ?$$

$$C \cdot I = P \left(1 + \frac{R}{100} - 1 \right)^T \quad \text{(or)} \quad C \cdot I = P \times (1 + x)^T$$

$$4347 = 30,000 \left(1 + \frac{7}{100} \right)^T$$

$$4347 = 30000 \left(\frac{107}{100}\right)^T - 1$$

$$4347 = 30000 \, (1.07)^T - 1$$

$$0.1449 = (1.07)^T - 1$$

add ① on both sides

$$1.1449 = (1.07)^t$$

$\Rightarrow$)
log on b.s $\log(1.1449) = \log(1.07)^t$

$$\log(1.1449) = t \log(1.07)$$

$$t = \frac{\log(1.1449)}{\log(1.07)}$$

$$\approx \frac{0.0582}{0.0291} \approx 2 \text{ years.}$$

$$1500 = \frac{540 \times 540 \times R}{200}$$

$$\frac{540}{18} = \frac{1500 \times 540 \times R^2}{100}$$

$$540 = 1500 \times R^2$$

$$36 = R^2 = R = \sqrt{36} = 6$$