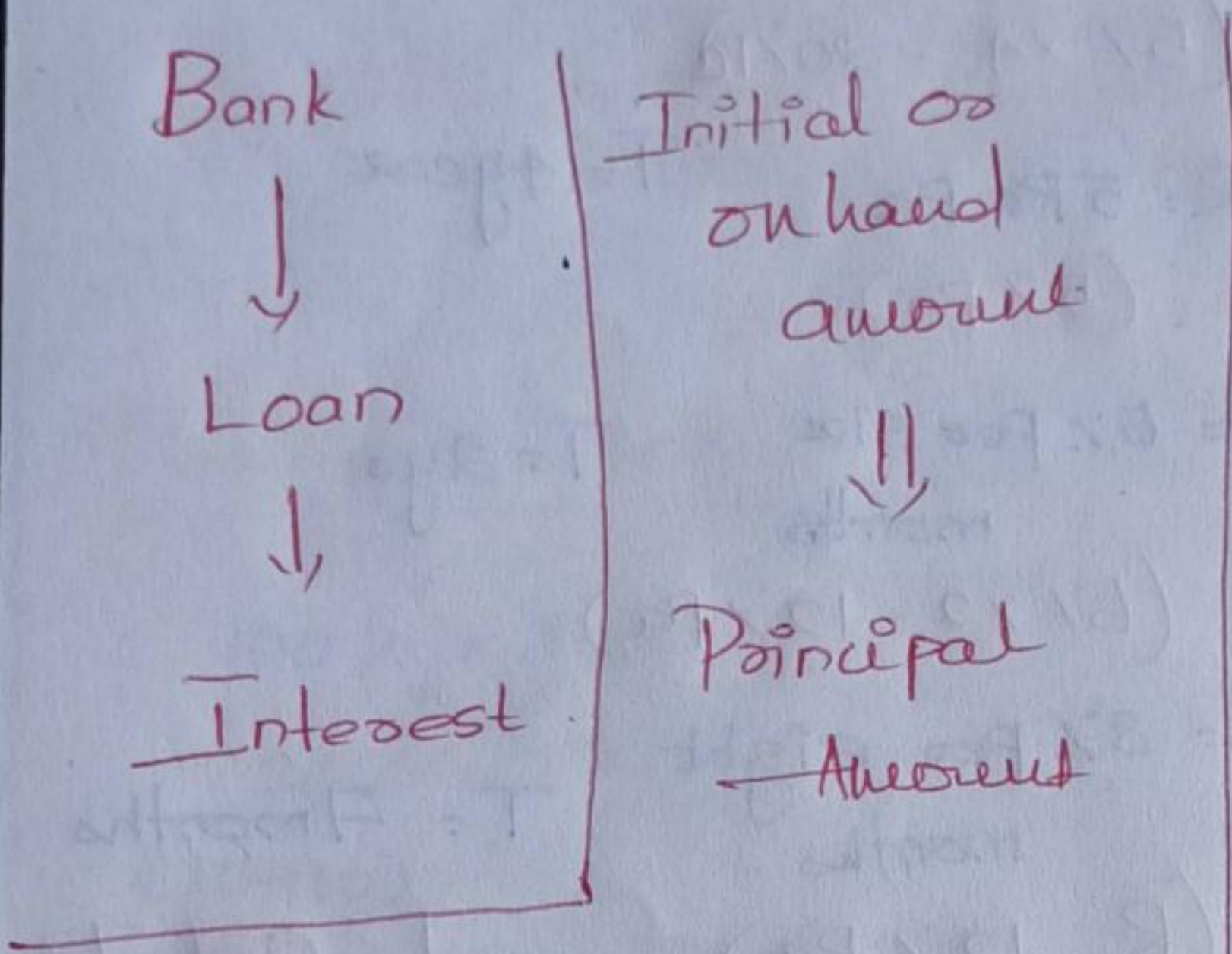




# Simple & Compound Interest

## Simple Interest



Formula

$$S.I = \frac{PTR}{100} \text{ or } \frac{PNR}{100}$$

$$A = P \left[ 1 + \frac{RT}{100} \right]$$

P = Principal  
 T = Time Duration  
 R = Rate of Interest  
 A = Total Amount.

### Example.

Bank = 1,00,000 Loan .₹  
 R = 10% Pa ; T = 3 years  
 P = 1,00,000

1<sup>st</sup> year =  $\frac{10}{100} \times 1L = 10,000$   
 2<sup>nd</sup> year = 10,000  
 3<sup>rd</sup> year = 10,000

$$S.I = \frac{1,00,000 \times 3 \times 10}{100}$$

$$= 3,000 \times 10$$

$$= 30,000$$

Total = 10,000  
 Interest

Total Amount = 1,00,000 + 30,000  
 = 1,30,000



Tricks For Questions Convert to formula

1.  $P = \text{Rs } 2000$   $R = 5\% \text{ Pa}$   $T = 3 \text{ yrs}$
2.  $P = \text{Rs } 2000$   $R = 5\% \text{ Pa}$   $T = 24 \text{ Months (2 years)} \frac{24}{12}$
3.  $P = \text{Rs } 2000$   $R = 5\% \text{ Pa}$   $T = 36 \text{ Months (3 years)} \frac{36}{12}$   
Per Quater  $\frac{1}{4}$   
( $5\% \times 4 = 20\% \text{ Pa}$ )
4.  $P = \text{Rs } 2000$   $R = 5\% \text{ Pa}$   $T = 4 \text{ year}$   
( $5\% \text{ Pa}$ )
5.  $P = \text{Rs } 2000$   $R = 6\% \text{ per six months}$   $T = 2 \text{ ya}$   
( $6\% \times 2 = 12\% \text{ Pa}$ )
6.  $P = \text{Rs } 2000$   $R = 8\% \text{ per eight months}$   $T = 7 \text{ months}$   
( $R = 12\% \text{ Pa}$ )  $T = \frac{7}{12} \text{ years}$
7.  $P = \text{Rs } 2000$   $R = 12\% \text{ per 6 months}$   $T = 6 \text{ years}$   
 $R = 12\% \times 2 = 24\% \text{ Pa}$
8.  $P = \text{Rs } 2000$   $R = 10\% \text{ Pa}$   $T = 2 \text{ years}$   
( $10 \times 4 = 40\% \text{ Pa}$ )



Example

1.  $P = \text{Rs } 2000$ ,  $R = 10\% \text{ Pa}$ ,  $T = 2 \text{ yrs}$ ,  $S.I = ?$

Formula

$$S.I = \frac{PTR}{100} = \frac{2000 \times 10 \times 2}{100}$$

$$S.I = 400$$

Percentage Method

$$100\% = 2000$$

$$20\% = x$$

$$(10+10)$$

$$100x = 2000 \times 20$$

$$x = 400$$

2.  $P = x$ ;  $R = 10\% \text{ Pa}$   $T = 2 \text{ yrs}$   $S.I = 400$

$$S.I = \frac{PNR}{100}$$

$$400 = \frac{P \times 2 \times 10}{100}$$

$$40000 = 2P$$

$$P = \frac{40000}{2}$$

$$P = 20000$$

$$100\% = P$$

$$20\% = 400$$

$$40000 = 20P$$

$$20P = 40000$$

$$P = \frac{40000}{20}$$

$$P = 2000$$



Example

1.  $P = \text{Rs } 2000$ ,  $R = 10\% \text{ p.a.}$ ,  $T = 2 \text{ yrs}$ ,  $S.I = ?$

Formula

$$S.I = \frac{PTR}{100} = \frac{2000 \times 10 \times 2}{100}$$

$$S.I = 400$$

Percentage Method

$$100\% = 2000$$

$$20\% = x$$

$$(10+10)$$

$$100x = 2000 \times 20$$

$$x = 400$$

2.  $P = x$ ;  $R = 10\% \text{ p.a.}$   $T = 2 \text{ yrs}$   $S.I = 400$

$$S.I = \frac{PNR}{100}$$

$$400 = \frac{P \times 2 \times 10}{100}$$

$$40000 = 2P$$

$$P = \frac{40000}{2}$$

$$P = 20000$$

$$100\% = P$$

$$20\% = 400$$

$$40000 = 20P$$

$$20P = 40000$$

$$P = \frac{40000}{20}$$

$$P = 2000$$





3.  $A = 2400, R = 10\% \text{ pa } T = 2 \text{ yrs}; P = ?$

$$A = P \left( 1 + \frac{TR}{100} \right)$$

$$2400 = P \left( 1 + \frac{10 \times 2}{100} \right)$$

$$2400 = P \left( \frac{5+1}{5} \right)$$

$$P \left( \frac{6}{5} \right) = 2400$$

$$6P = 2400 \times 5$$

$$6P = 12000$$

$$P = 2000$$

$$A = (\text{Amount} + \text{Interest})$$

$$P + I$$

$$100\% = x$$

$$120\% = 2400$$

$$A = P + I$$

$$100\% + (10 \times 2)$$

$$100\% + 20$$

$$120\%$$

$$240000 = 120x$$

$$x = \frac{240000}{120}$$

$$x = 2000$$

### Question Analysis

1. Simple Interest on a Certain Value is Rs 20

$$S.I = 20$$

2. Rs 1200 is Invested

$$P = 1200$$

3. The Amount becomes 1800

$$A = 1800 (P + I) - \text{Capital}$$

4. Maturity amount is Rs 2000

$$A = 2000$$





## Basic Questions

1. What would be the simple Interest accrued in 4 years on Principle Rs 18,440 at the rate of 15% Pa?

$$P = \text{Rs } 18,440$$

$$T = 4 \text{ years}$$

$$R = 15\% \text{ Pa}$$

$$100\% = 18,440$$

$$15 \times 4 = \text{S.I.}$$

$$\text{S.I.}(100) = 18,440 \times 15 \times 4$$

$$\text{S.I.} = \frac{18,440 \times 60}{100}$$

$$\text{S.I.} = 11,064$$

$$\text{S.I.} = \frac{P \times R \times T}{100}$$

$$= \frac{18,440 \times 60}{100}$$

$$= 11,064$$

2. Dinesh deposit an amount of Rs 65800 to obtain simple interest at 14% Pa for 4 years. what total amount will dinesh get at the end of 4 years

$$P = 65,800$$

$$R = 14\% \text{ Pa}$$

$$T = 4 \text{ yrs}$$

$$A = ?$$

$$A = P \left[ 1 + \frac{TR}{100} \right]$$

$$= 65800 \left( 1 + \frac{56}{100} \right)$$

$$= 65800 \left( \frac{156}{100} \right)$$

$$= 658 \times 156$$

$$\begin{array}{r} 12 \\ 65800 \end{array}$$

$$32900$$

$$3948$$

$$\hline 102648$$

$$658 \times 100$$

$$658 \times 50$$

$$658 \times 6$$

$$100\% = 65800$$

$$\frac{A+I}{100+56} = x$$

$$106x = 65800 \times 156$$

$$x = 658 \times 156$$

$$= 1,02,648$$

$$A = 1,02,648 (P+I)$$





3. Mr. A takes loan from Mr. B for 2 years at the rate of Interest 5% pa and after two years he gave back Rs 6600 to Mr. B. Complete the payment of loan. Find the Interest paid by Mr. A.

$$P = x$$

$$I = 5\% \text{ pa}$$

$$T = 2 \text{ years}$$

$$A = 6600$$

$$A = P \left( 1 + \frac{TR}{100} \right)$$

$$6600 = x \left( 1 + \frac{10}{100} \right)$$

$$6600 = x \left( \frac{11}{10} \right)$$

$$6600 \times 10 = 11x$$

$$11x = 66000$$

$$x = 6000$$

$$P = 6000$$

$$A = P + I$$

$$6600 = 6000 + I$$

$$I = 6600 - 6000$$

$$I = 600$$

The Interest paid by Mr. A is 600

$$\begin{aligned} (00) \quad (P+I) &= A \\ 110\% &= 6600 \\ 10\% &= x \end{aligned}$$

$$110x = 66000$$

$$x = \frac{66000}{110}$$

$$x = 600$$





4. A sum of Rs 2668 amounts to Rs. 4469 in 5 years at the rate of simple interest. Find the rate percentage.

$$P = 2668 \xrightarrow[5 \text{ yrs}]{?} 4469 \text{ (Total Amount)} \\ (P+I)$$

Formula

$$A = P \left( 1 + \frac{TR}{100} \right)$$

$$4469 = 2668 \left( 1 + \frac{5x}{100} \right)$$

$$4469 = 2668 \left( \frac{100+5x}{100} \right)$$

$$2668(100+5x) = 446900$$

$$266800 + 13340x = 446900$$

$$13340x = 446900 - 266800$$

$$x = \frac{180100}{13340}$$

$$\begin{array}{r} 314.6900 \\ 266800 \\ \hline 180100 \end{array}$$

$$x = 13.5\%$$

5. Find the difference in the total amount of Principal of Rs 4000 at the rate of 5% annually in 4 years.

Ans = 800

$$P = 4000$$

$$R = 5\%$$

$$T = 4 \text{ yrs.}$$

$$100\% = 4000$$

$$20\% = x$$

$$100x = 80000$$

$$x = \frac{80000}{100} = 800$$





## Comparison

1. Simple Interest for sum of Rs 1230 for 2 years is Rs 10 more than simple Interest for Rs 1130 for same duration. Find the rate of Interest?

a) 5    b) 6    c) 8    d) 2    e) 7

sum of  
P

$$S.I_1 - S.I_2 = 10$$

$$\frac{PTR}{100} - \frac{PTR}{100} = 10$$

$$\frac{1230 \times 2 \times R}{100} - \frac{1130 \times 2 \times R}{100} = 10$$

$$\frac{246R}{10} - \frac{226R}{10} = 10$$

$$246R - 226R = 10 \times 10$$

$$R(246 - 226) = 100$$

$$20R = 100$$

$$R = \frac{100}{20} = 5$$

$$R = 5\%$$

d) 2

$$2\% \times 2 = 4\%$$

1230	1130
12.3x	11.3x
<u>4</u>	<u>4</u>
49.2	45.2
(4) →	

a) 5

$$5\% \times 2 = 10\%$$

1230	1130
123	113
	(10) →





- 2) For a certain sum the simple interest for 2 yrs at 8% p.a. is Rs 110 more than the simple interest in 1 yr at 5% p.a. for same sum. Find the sum.

$$S.I_1 - S.I_2 = 110$$

$$\frac{PTR}{100} - \frac{PTR}{100} = 110$$

$$\frac{P \times 16}{100} - \frac{P(5)}{100} = 110$$

$$P(16-5) = 110 \times 100$$

$$11P = 11000$$

$$P = 1000$$

a) 5000

b) 1000

c) 1050

d) 1200

e) 950

- 3) Simple Interest for sum of Rs 1500 is Rs 30 in 4 yr and Rs 60 in 8 yr. Find the rate.

$$P = 1500 \quad S.I_1 \sim S.I_2 = 30$$

$$4 \text{ yr} \rightarrow \frac{PTR}{100} - \frac{PTR}{100} = 30$$

$$1500 \left( \frac{4x}{100} - \frac{8x}{100} \right) = 30$$

$$1500 \left( \frac{4x}{100} \right) = 30$$

$$60x = 30$$

$$x = \frac{30}{60} = \frac{1}{2} = 0.5\%$$

a) 2.5%

b) 1.5%

c) 0.5%

d) 0.25%

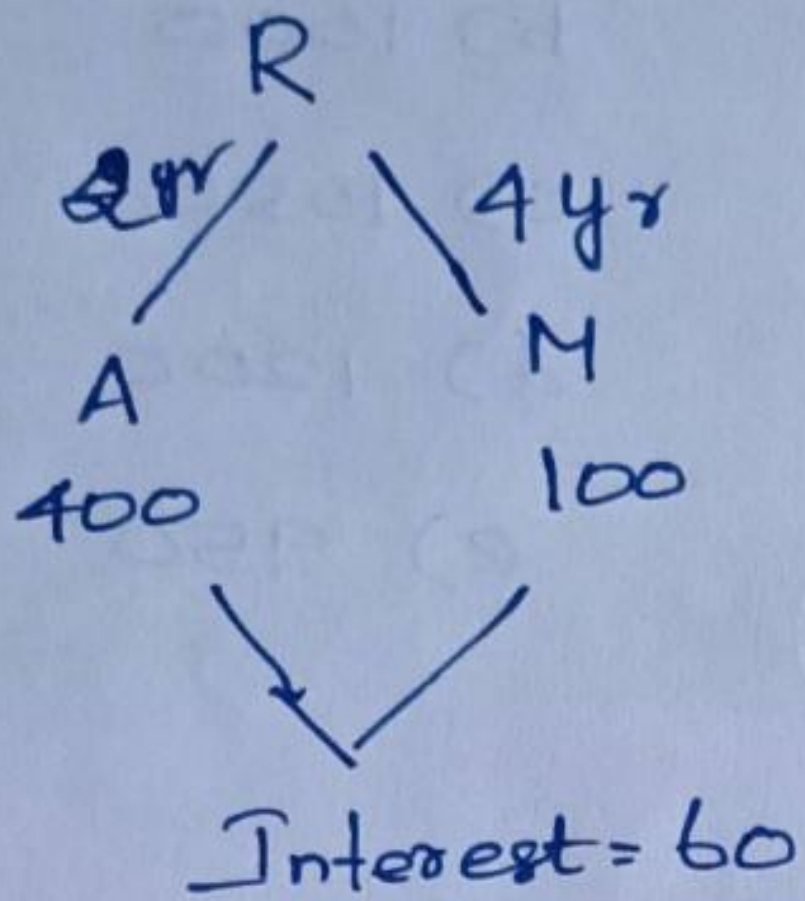
-/+ = +





4. Mr. R lent Rs 400 to Mr. A for 2 years and Rs 100 to Mr. H for 4 years and received from both Rs 60 as interest. Find the rate of Interest.

- a) 5%    b) 6%    c) 8%    d) 9%



$$SI_1 + SI_2 = 60$$

$$\frac{PNR}{100} + \frac{PNR}{100} = 60$$

$$\frac{400 \times 2R}{100} + \frac{100 \times 4R}{100} = 60$$

$$800R + 400R = 6000$$

$$1200R = 6000$$

$$R = \frac{6000}{1200}$$

$$R = 5\%$$

5. Arjun borrowed Rs 800 at 6% & Rajesh borrowed Rs 600 at 10%. After how much time will they both have equal debts?

- a)  $15\frac{1}{3}$  yr    b)  $14\frac{1}{2}$  yr    c)  $15\frac{1}{3}$  yr    d)  $16\frac{2}{3}$  yr

$$A = R$$

$$P + I = P + I$$

$$P + \frac{PTR}{100} = P + \frac{PTR}{100}$$

$$800 + \frac{800 \times 6R}{100} = 600 + \frac{600 \times 10R}{100}$$

~~$$800 \times 6R = 600 \times 10R$$~~

$$800 + 48R = 600 + 60R$$

$$60R - 48R = 800 - 600$$

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$$12R = 200$$

$$R = \frac{200}{12} = 16\frac{2}{3}\%$$

$$\begin{array}{r} 16 \\ 3 \overline{) 50} \\ \underline{3} \phantom{0} \\ 20 \\ \underline{18} \\ 2 \end{array}$$