

CAVALRY DEFENCE ACADEMY, (CDA) DEHRADUN - 8381042191



**SIMPLE INTEREST &
COMPOUND INTEREST**





SIMPLE INTEREST & COMPOUND INTEREST

Interest

- When a person or firm borrows money (loan) a bank, banker or any other person, then at the time of returning the amount (borrowed money), the borrowed amount has to be paid with some extra amount. This extra amount is known as **Interest**. Some terms related to interest are as follows.

Principal

- The borrowed money (loan) is known as **principal**. It is denoted by P .

Time

- The time period for which the principal (loan) is borrowed is known as **time** and it is denoted by T or t .



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Rate of Interest

- The rate at which interest is calculated on borrowed money is known as rate of interest.

Rate of interest is denoted by r or R .

Amount

- The sum of interest and principal is known as amount.



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Simple Interest (SI)

- When interest is calculated on borrowed money, the obtained interest is known as simple interest. Simple interest is denoted by SI.
- $SI = \text{principal} \times \text{rate} \times \text{time} / 100 = p \times r \times t / 100$
and Amount = SI + P.



SIMPLE INTEREST & COMPOUND INTEREST

Q.1 The simple interest of ₹ 6500 for at 10% is

(a) ₹945

(b) ₹975

(c) ₹950

(d) ₹960



SIMPLE INTEREST & COMPOUND INTEREST

Q 2. The simple interest of ₹ 6500 for at 10% is

(a) ₹945

(b) ₹975

(c) ₹950

(d) ₹960



SIMPLE INTEREST & COMPOUND INTEREST

Q 3. Simple interest of ₹6250 for 4yr at the rate of 5% per annum must be

- (a) ₹1250 (b) ₹7500 (c) ₹5000 (d) ₹3250



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Q 4. The simple interest on ₹2000 for 6 months at the rate of 4% per annum is

- (a) ₹ 55 (b) ₹ 105 (c) ₹ 45 (d) ₹ 35



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Q 5. The simple interest on ₹ 1300 at the rate of 5% per annum for 146 days is

- (a) ₹ 38 (b) ₹ 26 (c) ₹ 48 (d) ₹ 39



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Q 6. A farmer borrowed ₹ 5300 at 8% per annum (on simple interest), at the end of 2 1/2 yr., he cleared his account by paying ₹4600 and a watch. The cost of watch is

(a) ₹1760

(b) ₹1860

(c) ₹1960

(d) ₹1660

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Q 7. The simple interest at $x\%$ for x years will be ₹ x on a sum of

(a) ₹ x

(b) ₹ $100x$

(c) ₹ $(100/x)$

(d) ₹ $(100/x^2)$



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Q 8. In how much time an amount becomes double at the rate 10% per annum?

- (a) 5yr
- (b) 4yr
- (c) 10yr
- (d) 2yr



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Q 9. How much time will it take for an amount of ₹900 to yield ₹81 as interest at 4.5% per annum of simple interest?

A. 33 years B. 11 year C. 44 years D. 22 years



SIMPLE INTEREST & COMPOUND INTEREST

Q 10. Arun took a loan of ₹1400 with simple interest for as many years as the rate of interest. If he paid ₹686 as interest at the end of the loan period, what was the rate of interest?

A.6%

B.8%

C.7%

D.4%



SIMPLE INTEREST & COMPOUND INTEREST

Q 10. Arun took a loan of ₹1400 with simple interest for as many years as the rate of interest. If he paid ₹686 as interest at the end of the loan period, what was the rate of interest?

A.6%

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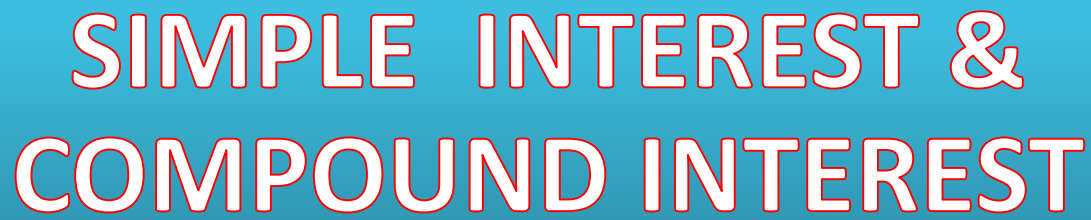
D.4%



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Q 11. A sum of money at simple interest amounts to ₹815 in 3 years and to ₹854 in 4 years. What is the sum?

- A. ₹700 B. ₹690 C. ₹698 D. ₹650



A. ₹700 B. ₹690 C. ₹698 D. ₹650

Concept

$39 = P \times 3 \times R \div 1.5 = 13$

$PR\% = \frac{39}{13} = 3$

$439 = P \times 4 \times R \div 1.5$

$PR\% = \frac{39}{4}$

Unitary method

tricks

815

39

39

39

39

39

776

737

698

derunk

साधारण व्याज - 6 years

₹ 30, 30, 30, 30, 30



SIMPLE INTEREST & COMPOUND INTEREST

Q 12. The simple interest on a certain sum for 8 months at 4% simple interest is Rs.129 less than the simple interest on the same sum for 15 months at 5% per annum. Then the sum is

- A. Rs.3,400 B. Rs.3,500 C. Rs.3,600 D. Rs.3,700



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13. In a certain Principal if the Simple interest for two years is Rs 2400 and Compound interest for the two years is Rs 2544, what is the rate of Interest?

A. 12 percent B. 6 percent C. 24 percent D. 18 percent



SIMPLE INTEREST & COMPOUND INTEREST

14. A sum of money at simple interest amounts to 815 in 3 years and to 854 in 4 years. The sum is:

A. 650

B. 690

C. 698

D. 700



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15. A sum of 12,500 amounts to 15,500 in 4 years at the rate of simple interest. What is the rate of interest?

- A. 3% B. 4% C. 6% D. None of these



SIMPLE INTEREST & COMPOUND INTEREST

16. A sum of money doubles itself in 6 years. Find the rate of simple interest per annum?

- A. 16.66% B. 33.33% C. 25% D. 9.99%



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17. If a sum of money at simple interest doubles itself in 6 years, it will become four times in
- A. 14 Year B. 12 Year C. 18 Year D. 16 Year



SIMPLE INTEREST & COMPOUND INTEREST

18. A sum of money doubles itself in 8 years at the rate of simple interest, how much time will it take to become 4 times -
A. 14 Year B. 12 Year C. 18 Year D. 16 Year



SIMPLE INTEREST & COMPOUND INTEREST

19. A certain sum of money becomes three times of itself in 20 years at simple interest. In how many years does it become double itself at the same rate of simple interest ?

A. 8 years B. 10 years C. 12 years D. 14 years



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20. A certain sum of money doubles itself in 4 years at a certain rate of simple interest, then in how many years will it become 16 times?

A. 25 Years B. 60 Years C. 30 वर्ष D. 24 वर्ष



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Compound Interest (CI)

- If the borrower and the lender agree to fix up a certain interval of time (say, a year or a half year or a quarter of 2yrs, etc.), so that the amount at the end of an interval becomes the principal for the next interval, then the total interest over all.



SIMPLE INTEREST & COMPOUND INTEREST

- For the one year SI and CI both are equal, for the Same R, P and T.
- In Compound interest, amount at the end of the 1st year will become the principal for the 2nd year and amount of the end of 2nd year will become the principal of third year, and so on.

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Important Formulae

When interest is compounded annually. Then

$$\text{Amount} = P(1+R/100)^N$$

When interest is compounded half-yearly or semi-annually.

Then, Interest would be calculated after every six months

Therefore, time = $2n$ and rate = $R/2$

- Amount = $p(1 + \frac{R/2}{100})^n$



SIMPLE INTEREST & COMPOUND INTEREST

- ☐ When interest is compounded half-yearly or semi-annually. Then, Interest would be calculated after every six months
 - Therefore, time = $2n$ and rate = $R/2$
 - $\text{Amount} = \frac{p(1 + \frac{R}{2})^{2n}}{100}$
- ☐ When interest is compounded quarterly. Then, interest would be calculated after every three months,
 - Therefore, time = $4n$ and rate = $R/4$
 - $\text{Amount} = \frac{p(1 + \frac{R}{4})^{4n}}{100}$
- ☐ When time is given in fraction of a year i.e., $11/3$ yr , $7/3$ yr etc.



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- Let the time be a fraction of a year say $4 \frac{2}{3}$ yr and is compounded annually.
- Amount = $p(1 + R/100)^4 (1 + \frac{2/3 R}{100})$

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- When rates are different for different years $R_1\%$, $R_2\%$, $R_3\%$ for first, second and third year respectively.

Then, combined can be determined by the formula

$$\text{Amount} = P (1 + R_1 / 100) (1 + R_2 / 100) (1 + R_3 / 100)$$

- Difference between CI and SI for 2yr, for the same rate of interest, time and principal is given by $D = \frac{P \times r^2}{100^2}$

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21. The Compound Interest on ₹12600 for 2yr at 10% per annum compounded annually?

(a) ₹2646

(b) ₹3646

(c) ₹5646

(d) ₹4146



SIMPLE INTEREST & COMPOUND INTEREST

- ❑ Find the compound interest when principal = Rs 3000, rate = 5% per annum and time = 2 years.



SIMPLE INTEREST & COMPOUND INTEREST

- ❑ What will be the compound interest on Rs 4000 in two years when rate of interest is 5% per annum?



SIMPLE INTEREST & COMPOUND INTEREST

- ❑ Rohit deposited Rs 8000 with a finance company for 3 years at an interest of 15% per annum. What is the compound interest that Rohit gets after 3 years?



SIMPLE INTEREST & COMPOUND INTEREST

- ❑ Find the compound interest on Rs 1000 at the rate of 8% per annum for 1 years when interest is compounded half-yearly.



SIMPLE INTEREST & COMPOUND INTEREST

- ❑ Swati took a loan of Rs 16000 against her insurance policy at the rate of $12\frac{1}{2}\%$ per annum. Calculate the total compound interest payable by Swati after 3 years.



SIMPLE INTEREST & COMPOUND INTEREST

- ❑ Roma borrowed Rs 64000 from a bank for $1\frac{1}{2}$ years at the rate of 10% per annum. Compute the total compound interest payable by Roma after $1\frac{1}{2}$ years, if the interest is compounded half-yearly.



SIMPLE INTEREST & COMPOUND INTEREST

- ❑ Mewa Lal borrowed Rs 20000 from his friend Rooplal at 18% per annum simple interest. He lent it to Rampal at the same rate but compounded annually. Find his gain after 2 years.



SIMPLE INTEREST & COMPOUND INTEREST

- ❑ Find the compound interest on Rs 64000 for 1 year at the rate of 10% per annum compounded quarterly.



SIMPLE INTEREST & COMPOUND INTEREST

- ❑ Ramesh deposited Rs 7500 in a bank which pays him 12% interest per annu compounded quarterly. What is the amount which he receives after 9 months.



SIMPLE INTEREST & COMPOUND INTEREST

- ❑ 1. Compute the amount and the compound interest in each of the following by using formulae when:
- (i) Principal = Rs 3000, Rate = 5%, Time = 2 years
 - (ii) Principal = Rs 3000, Rate = 18%. Time = 2 years
 - (iii) Principal = Rs 5000, Rate = 10 paise per rupee per annum, Time = 2 years
 - (iv) Principal = Rs 2000, Rate = 4 paise per rupee per annum, Time = 3 years
 - (v) Principal = Rs 12800, Rate = 7%, Time = 3 years
 - (vi) Principal = Rs 10000, Rate 20% per annum compounded half-yearly, Time = 2 years
 - (vii) Principal = Rs 160000, Rate = 10 paise per rupee per annum compounded half-yearly, Time = 2 years.



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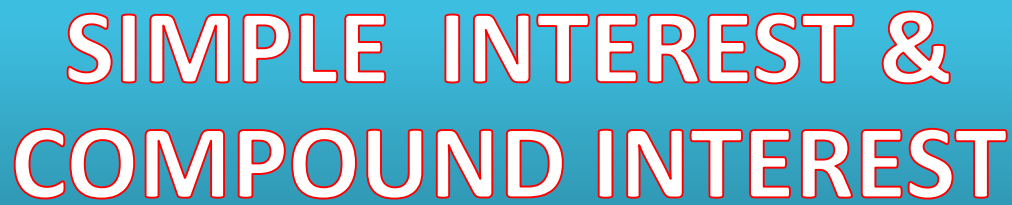
2. Find the amount of Rs 2400 after 3 years, when the interest is compounded annually at the rate of 20% per annum.



SIMPLE INTEREST & COMPOUND INTEREST

A sum of money placed at compound interest doubles itself in 4 years. In how many years will it amount to 8 times?

A. 9 years B. 8 years C. 27 years D. 12 years



2nd year $\rightarrow$ SI

$CI + CI$

$$10\% = 1/10$$

10%

Compounded Annually

100,

10%

CI-SI

$$15\% = \frac{3}{20}$$
$$20\% = 1/5$$
$$5\% = \frac{1}{20}$$

①

CI-SI $\rho = ?$ $\gamma = \%$ $t = \text{given}$

2)

$p = \text{given}$ $\sigma = \% \downarrow$ $t = \text{given}$ $C I = Y(\dots)$

5

④ P = given $\sigma = \%$ $t = \text{Days}$ $CJ / CJ - SI / \cos CJ / \text{find}$



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Two years (80%)

$t = 2 \text{ years}$

$r = 15\%$

Three years

$CI - SI = ₹ 180$

find $CI = ?$

formula

$$r\% = \frac{CI - SI}{\frac{1}{2} \times SI} \times 100$$

$$15 = \frac{\cancel{180} \times 12}{\frac{1}{2} \times SI} \times 100$$

$$SI = 2400$$

$$CI = 2400 + 180 = \underline{2580}$$



SIMPLE INTEREST & COMPOUND INTEREST

$$r = \frac{15}{100} = 15\%$$

$$t = 2 \text{ year}$$

$$CI - SI = 180$$

$$CI = ?$$

Concept

Let the principal be 400

$$20^2 = 400$$

$$SI \rightarrow \underline{120}$$

$$CI = 60 + 60 + 9$$

$$= \underline{129}$$

$$CI - SI = \underline{9 \text{ unit}}$$

$$90 \rightarrow 180$$

$$1 \rightarrow \underline{20}$$

$$SI = 120 \times 20 = 60$$

$$P = 400 \times 20 = \underline{18000}$$



$$\frac{60}{9}$$

$$69$$

$$CI = 129 \times 20 = \underline{2580}$$

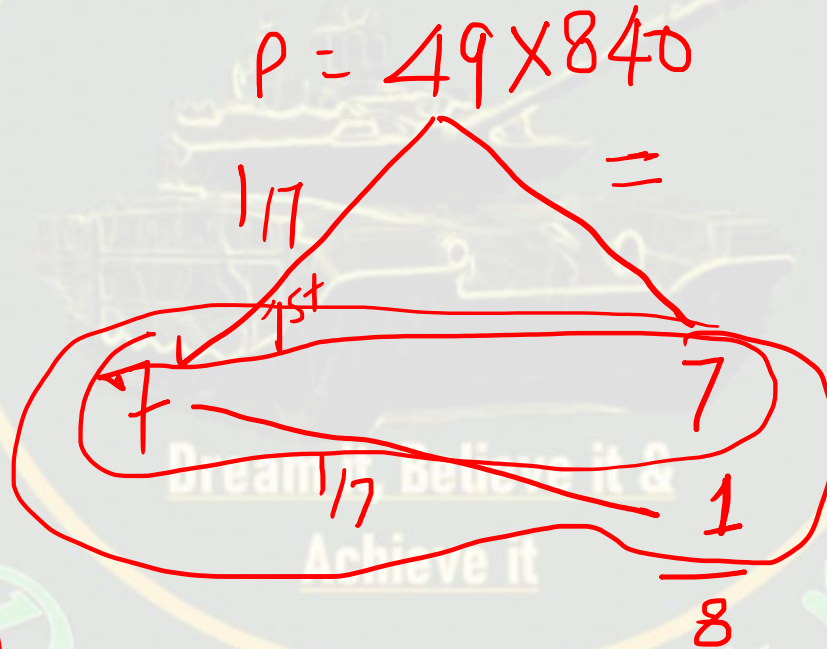
$$\frac{3 \times 60}{20} = 9$$



SIMPLE INTEREST & COMPOUND INTEREST

Practice Principal = ? rate = $14\frac{2}{7}\%$ $= \frac{100}{7}\% = \frac{1}{7}\%$
 $CI - SI = 840$ $t = 2 \text{ years}$
 $7^2 = 49$

formula ↓
 $\delta\% = \frac{CI - SI}{\frac{1}{2} \times SI} \times 100$
 $SI, \delta = t =$
 $P = ?$
 $SI = PRT\%$
Advance Maths



$SI = 14$
 $CI = 15$
 $CI - SI = 840$
 $15\% = \frac{15}{100}$
 $10\% = \frac{10}{100}$
 $\frac{100}{7}\% = \frac{100}{7 \times 100} = \frac{1}{7}$

$SI = 14 \times 840$
 $CI = 15 \times 840$



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$$P = ? \quad r = 10\% \Rightarrow \frac{1}{10}$$

$$t = 3 \text{ years} \quad \text{CI} = 6620$$

$$20\% = \frac{1}{5} \Rightarrow \frac{6}{100}$$

$$10\% = 1000$$

1st	10	—	11	331	→ 6620
2nd	10	—	11	1	→ 6620
Third	10	—	11	1	→ 20

$$\begin{array}{r} 10000 \\ - 1331 \\ \hline \end{array}$$

Principal Amount

$$P = 10000 \times 20$$

$$= 20000$$

$$\text{Amount} = 1331$$

$$\times 20$$

$$26620$$

$$\begin{array}{r} 10000 \\ \times 10 \\ \hline 100000 \\ \times 10 \\ \hline 1000000 \\ \times 10 \\ \hline 10000000 \end{array}$$

CI = 331



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Pal → group

Aksh Sharma → group

Anjeet - group

Suriyansh - group

my files
whatsapp

medi9

Documents

select - copy
move

folder

CPA
Maths



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SIMPLE INTEREST & COMPOUND INTEREST

for two
years

$$r = 10\% \text{ P.A.}$$

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

1 st	10	—	11
2 nd	10	—	11

$$100 - 121$$

$$\cancel{CI - SI = 180}$$
$$CI - 63$$

$$CI - 21$$

$$21 - 63$$

$$1 - 3$$

with the
squares

Prin

amount

$$P = 100 \times 3$$
$$= 300$$



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- ❑ 10000 workers were employed to construct a river bridge in four years. At the end of first year, 10% workers were retrenched. At the end of second year, 5% of the workers at that time were retrenched. However to complete the project in the, the number of workers was increased by 10% at the end of the third year. How many workers were working during the fourth year?



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In a factory the production of scooters rose to 48400 from 40000 in 2 years. Find the rate of growth per annum.