

14/11/2025 8. Compound Interest Basic

$$A = P \left(1 + \frac{x}{100}\right)^n \rightarrow \text{times}$$

$$CI = A - P \\ \Rightarrow P \left[\left(1 + \frac{x}{100}\right)^n - 1 \right]$$

$$A = P \left(1 + \frac{x_1}{100}\right) \left(1 + \frac{x_2}{100}\right) \left(1 + \frac{x_3}{100}\right), \dots$$

$$\text{diff } CI - SI$$

$$2\text{yr} \Rightarrow CI - SI = P \left(\frac{P}{100}\right)^2$$

$$3\text{yr} \Rightarrow CI - SI = P \left(\frac{P}{100}\right)^2 \left(\frac{300+P}{100}\right)$$

Installment :-

x = installment

$$2\text{yr} \Rightarrow P = \frac{x}{\left(1 + \frac{x}{100}\right)} + \frac{x}{\left(1 + \frac{x}{100}\right)^2}$$

$$3\text{yr} \Rightarrow P = \frac{x}{\left(1 + \frac{x}{100}\right)} + \frac{x}{\left(1 + \frac{x}{100}\right)^2} + \frac{x}{\left(1 + \frac{x}{100}\right)^3}$$

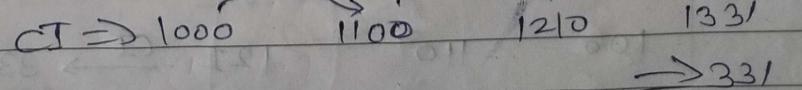
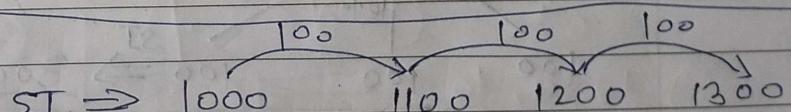
1000

3yrs

SI $\rightarrow 100\text{₹}/\text{yr} - \text{Extra}$

$10\%/\text{yr} \text{ SI}$

$10\%/\text{yr} (CI)$



(H) 10%, 3yr, CI

successive Diff

P	A	
10	11	100 $\xrightarrow{33.1} 133.1$
10	11	10000 $\xrightarrow{3310} 13310$
10	11	100000 $\xrightarrow{33100} 133100$
1000	1331	2810000 $\xrightarrow{331000}$
	331	10%, 3yr, CI

Imp

$$5\%, 2\text{yr} \Rightarrow 10\%$$

$$\text{CI \% } (A + B + \frac{AB}{100})$$

$$5+5+\frac{25}{100} = 10.25\%$$

$$10\%, 2\text{yr} \Rightarrow 20\%$$

$$21\%$$

$$20\%, 2\text{yr} \Rightarrow 40\%$$

$$44\%$$

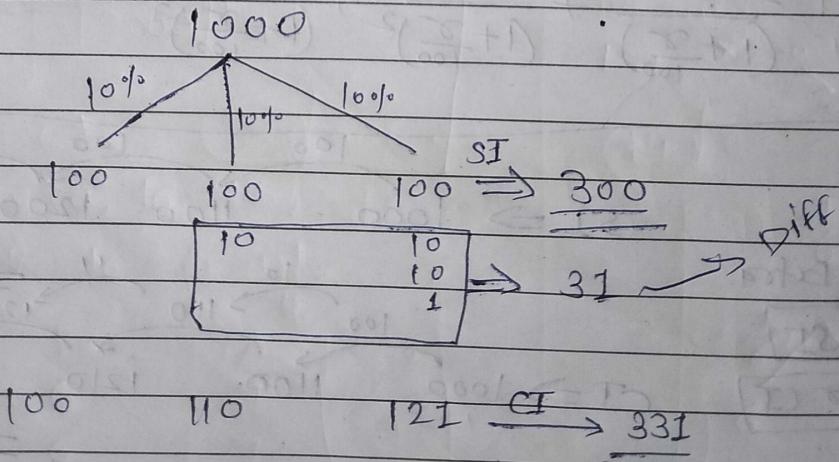
$$10\%, 3\text{yr} \Rightarrow 30\%$$

$$33.1\%$$

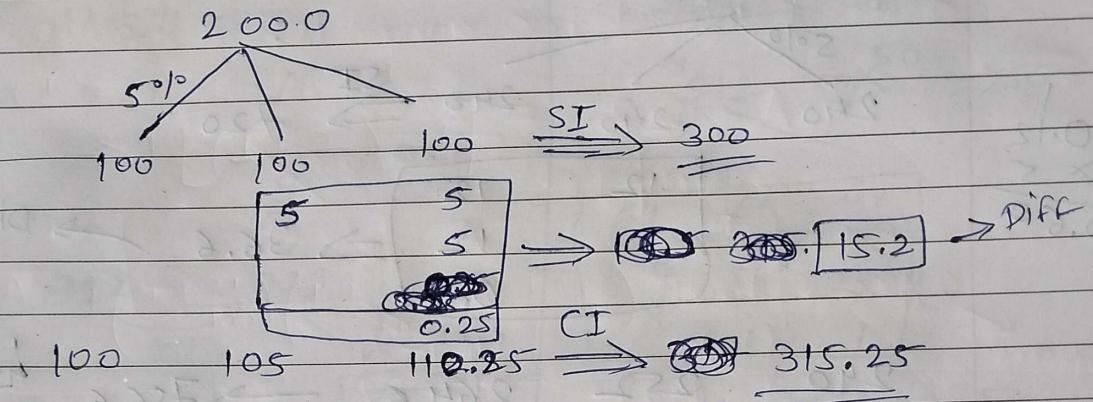
$$8\%, 2\text{yr} \Rightarrow 16\%$$

$$16.64\%$$

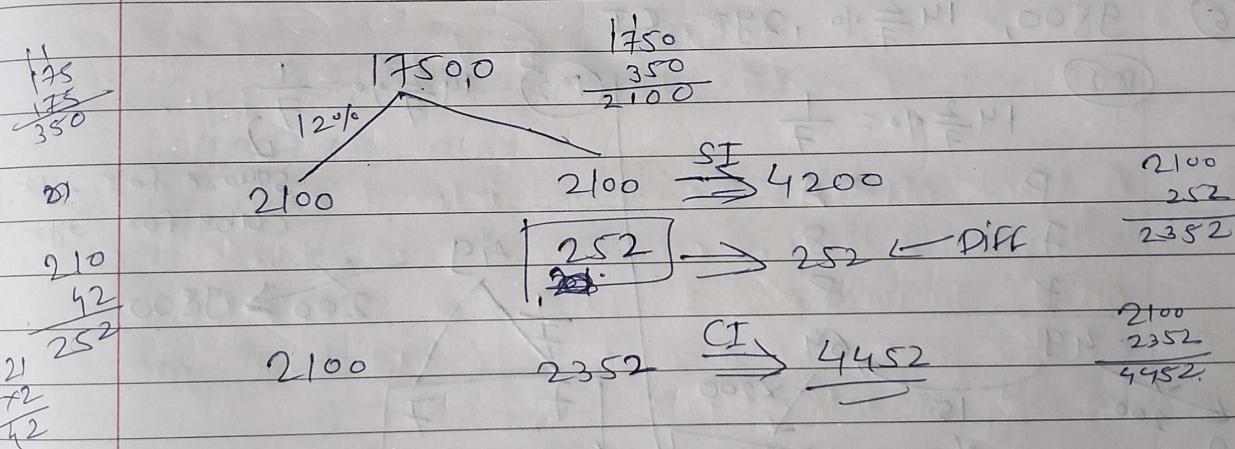
D) 1000, 10%, 3yr CI



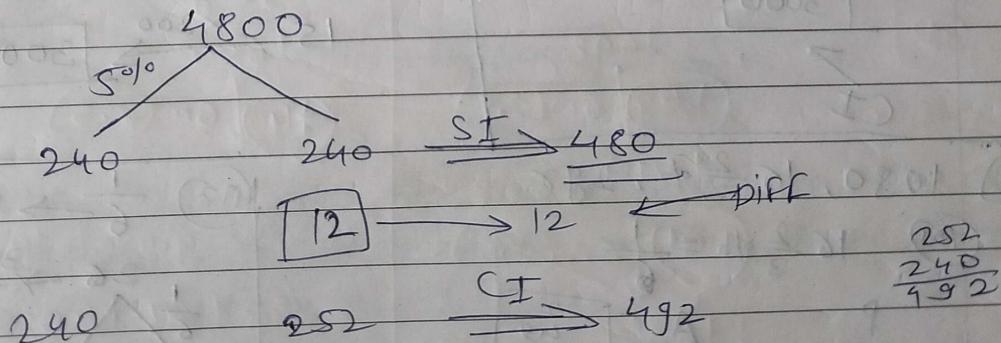
2) 2000, 5%, 3 yr, CI



3) 17500, 12%, 2 yr CI



4) 4800, 5%, 2 yr, CI

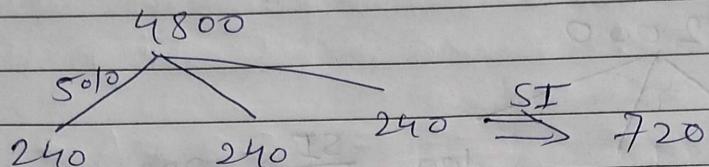


(5) 4800, 5%, 3 yrs, CI

$$\begin{array}{r} 48 \\ \times 5 \\ \hline 240 \end{array}$$

$$\begin{array}{r} 240 \\ + 240 \\ \hline 480 \end{array}$$

$$\begin{array}{r} 480 \\ + 720 \\ \hline 1200 \end{array}$$



$$\begin{array}{r} 0.12 \\ \times 5 \\ \hline 0.60 \end{array}$$

$$\begin{array}{r} .12 \\ \times 12 \\ \hline 12 \\ 12 \\ \hline 0.6 \end{array} \Rightarrow 36.6 \rightarrow \text{Diff}$$

$$\begin{array}{r} 240 \\ 252 \\ 264.6 \\ \hline 756.6 \end{array}$$

$$\begin{array}{r} 692 \\ - 264.6 \\ \hline 756.6 \end{array}$$

(6) 9800, $14\frac{2}{7}\%$, 2 yrs, CI

$$(m1) 14\frac{2}{7}\% = \frac{1}{7}$$

$$\begin{array}{r} P \quad A \\ 7 \quad 8 \\ 7 \quad 8 \\ \hline 49 \quad 64 \\ 200 \quad 15 \\ \downarrow \quad \downarrow \\ 9800 \quad 12800 \\ \downarrow \quad \downarrow \\ 3000 \\ \downarrow \\ \text{CI} \end{array}$$

$\times 200$

$$(m2) 14\frac{2}{7}\% = \frac{1}{7}$$

$$\begin{array}{r} \text{square for 2yr} \\ \text{cube for 3yr} \\ 49 \\ \downarrow \\ 7 \quad 7 \\ \downarrow \quad \downarrow \\ 15 \quad 200 \\ \downarrow \quad \downarrow \\ 3000 \quad 3000 - \text{CI} \end{array}$$

(7) 1080, $16\frac{2}{3}\%$, 2 yrs

$$(m1) 16\frac{2}{3}\% = \frac{1}{6}$$

$$\begin{array}{r} P \quad A \\ 6 \quad 7 \\ 6 \quad 7 \\ \hline 36 \quad 49 \\ 30 \quad 30 \\ \downarrow \quad \downarrow \\ 1080 \quad 1470 \\ \downarrow \quad \downarrow \\ 390 \quad \text{CI} \\ \downarrow \\ 13 \times 30 \end{array}$$

$$(m2) \frac{1}{6} \rightarrow \text{square}$$

$$\begin{array}{r} 36 \times 30 \\ \downarrow \\ 6 \quad 6 \\ \downarrow \quad \downarrow \\ 13 \times 30 \\ \downarrow \\ 390 - \text{CI} \end{array}$$

~~25600~~ 8
~~182~~ PAGE 81
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g) 25600, $12\frac{1}{2}\%$, 38%, (I)

$$\textcircled{11} \quad 12\frac{1}{2}\% = \frac{1}{8}$$

$$\begin{array}{r}
 & P & A \\
 & 8 & g \\
 \times & 8 & \times \\
 & 8 & g \\
 \times & 8 & \times \\
 \hline
 & 512 & 729 \\
 & \swarrow 50 & \nearrow 50 \\
 5600 & & \\
 & \downarrow x50 & \downarrow x50 \\
 & 217 & 136450 \\
 & \downarrow x50 & \\
 & 10850 &
 \end{array}$$

$$(72) \frac{1}{8} \rightarrow \text{cube}$$

10) $16000, 10\%, 11\frac{1}{9}\%$, $12\frac{1}{2}\%$, CI

(S72) Not apply

$$10\% = \frac{1}{10}, \quad 11\frac{1}{9}\% = \frac{1}{9}, \quad 12\frac{1}{2}\% = \frac{1}{8}$$

The diagram shows a horizontal beam supported by two vertical columns labeled P and A. Column P is on the left, and column A is on the right. A central horizontal force of 6000 N acts downwards at the center of the beam. At the left end (P), there is a reaction force of 8 acting at an angle of 2000° from the vertical. At the right end (A), there is a reaction force of 11. The beam has a length of 3.

7] On what sum does the difference between the compound interest and the simple interest and the simple interest for 3 years at 10% is Rs. 31?

10%, 382

$$\begin{array}{c}
 10\%, 38x \\
 \text{ST} \quad \text{CT} \\
 30\% \quad 33.1\%
 \end{array}
 \quad
 \begin{array}{c}
 100\% \xrightarrow[10]{\quad} 1000
 \end{array}$$

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8. Compound Interest

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- 2) If the amount is 2.25 times of the sum after 2 years at compound interest (compound annually), the rate of interest per annum is:



$$A = 2.25 = \frac{225}{100}$$

P	A
2 yrs \Rightarrow	225
$(10)^2$ square	$(15)^2$
1 yr \Rightarrow	10 \rightarrow 15 $\sqrt{5}$

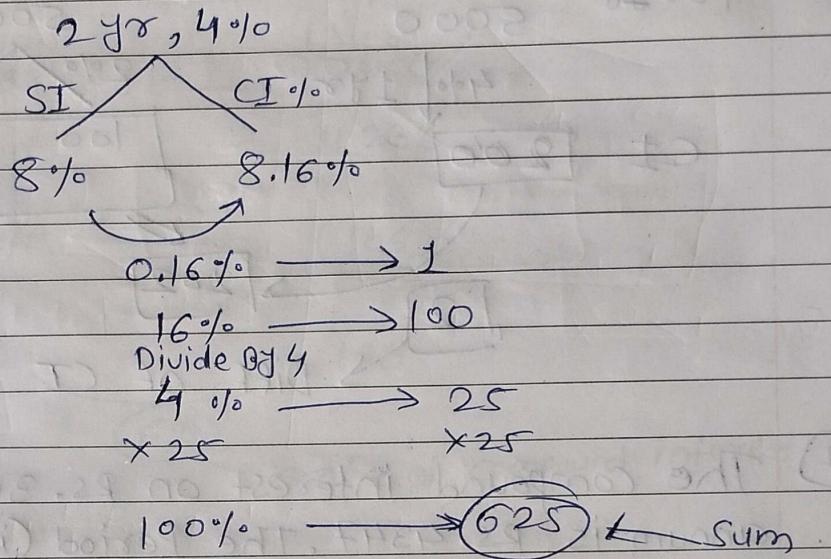
$$\frac{5}{10} \times 100 = 50\% \quad \leftarrow \text{rate of interest}$$

Compound questions

- 3) A bank offers 5% compound interest calculated on half-yearly basis. A customer deposits Rs. 1600 each on 1st January and 1st July of a year. At the end of the year, the amount he would have gained by way of interest is:

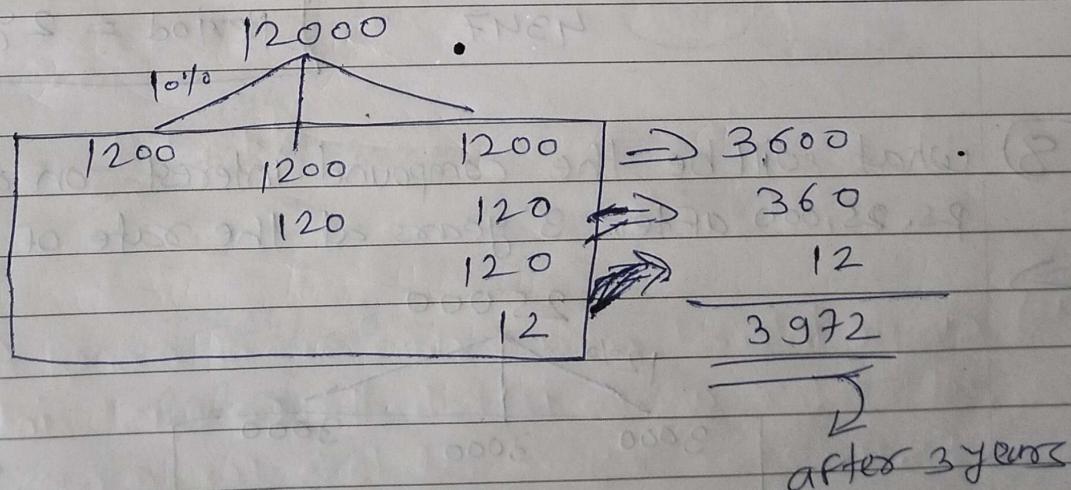
5% 1 yr \rightarrow 2.5% \rightarrow 6 months	
1 st Jan	1 st July
1600	1600
$(+40) \mid 6m(2.5)$	$(+40) \mid 6m(2.5)$
1640	
$(+41) \mid 6m(2.5)$	amount gained by interest:-
1681	$40 + 41 + 40 = \underline{\underline{121}}$

4) The difference between simple and compound interests compounded annually on a certain sum of money for 2 years at 4% per annum is Rs. 1. The sum (in Rs) is :-



5] There is 60% increase in an amount in 6 years at simple interest. what will be the compound interest of Rs. 12,000 after 3 years at the same rate.

$$60\%, 6\text{yr} \Rightarrow 10\%, 18\text{yr}$$



6) What is the difference between the compound interests on Rs. 5000 for 1 years at 4% Per annum compounded yearly and half-yearly?



For 1 yr

5000

4% ↓ 1 yr

CI

200

for 6 months :-

5000

2%	100	100
		2

2

↓ DIFF OF CI

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



30,000

7%

2100	2100
	147

4347.

Period = 2 yrs

8)

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?



25000

12%

3000	3000	3000
360	360	360
		43.2

9000

1080

43.2

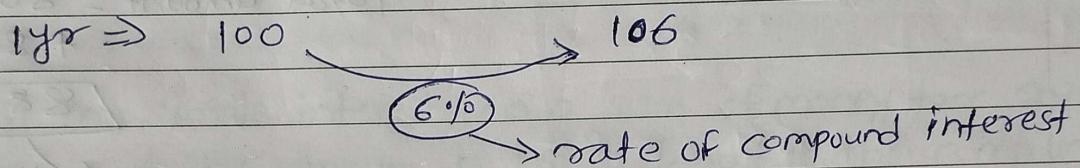
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Compound Interest

9) At what rate of compound interest per annum will a sum of Rs. 1200 become Rs. 1348.32 in 2 years?

P	A
1200	1348.32
120000	134832
Divide By 12	
10000	11236

2 yrs $\Rightarrow (100)^2$ $(106)^2$

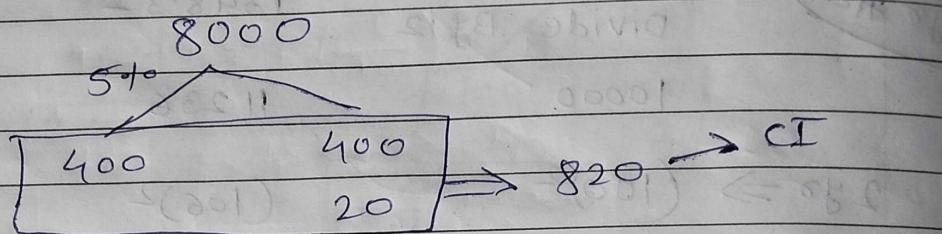


10) The least number of complete years in which a sum of money put out at 20% compound interest will be more than doubled is:

100	$+20 \downarrow$ $+24 \downarrow$ $+28.8 \downarrow$ $+34.56 \downarrow$ $+40.92 \downarrow$	120
120		144
144		172.8
172.8		207.36
207.36		

(4 yrs) — required to double

- (1) Albert invested an amount of Rs. 8000 in a fixed deposit scheme for 2 years at compound interest rate 5% p.c.p.a. How much amount will Albert get on maturity of the fixed deposit?



$$\text{Total amount} = 8000$$

$$\begin{array}{r} 001 \\ + 820 \\ \hline 8820 \end{array}$$

\swarrow
Total amount
after 2 years

- (2) The effective annual rate of interest corresponding to a nominal rate of 6% per annum payable half-yearly is:



$$6\% \rightarrow 1 \text{ yr}$$

$$\text{Half yr} = 2 \text{ times}$$

$$3\% \rightarrow 6 \text{ months}$$

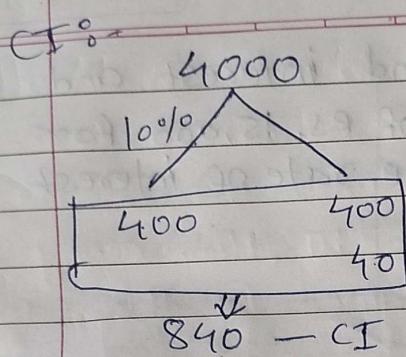
$$A + B + \frac{AB}{100}$$

$$3 + 3 + \frac{9}{100} = (6.09\%)$$

\swarrow
Ans

- (3) Simple interest on a certain sum of money for 3 years at 8% per annum is half the compound interest on Rs. 4000 for 2 years at 10% per annum. The sum placed on simple interest is:





SI :- 3 yrs, 8% Half of CI

$$24\% \rightarrow 420$$

Divide by 6

$$4\% \rightarrow 70$$

$$\times 25 \quad \times 25$$

$$100\% \rightarrow 1750$$

~~sum~~ sum of
money
for 3 yrs, 8%

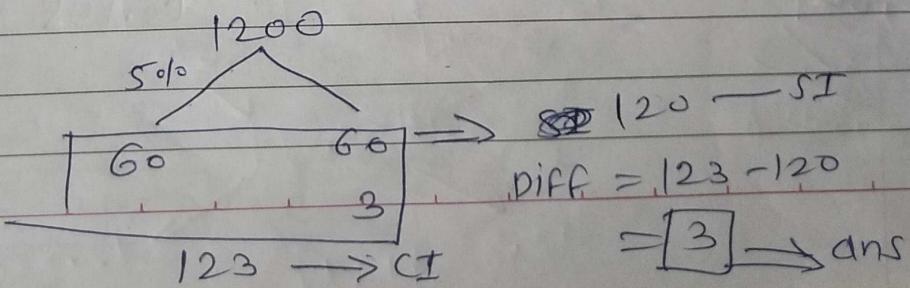
- 14) If the simple interest on a sum of money for 2 years at 5% per annum is Rs. 50. What is the compound interest on the same at the same rate and for the same time?

$$\begin{array}{ccc} \xrightarrow{\text{SI}} & & \xrightarrow{\text{CI}} \\ 10\% & \xrightarrow{\times 5} & 50 \\ & & \\ \xrightarrow{\text{SI}} & & \xrightarrow{\text{CI}} \\ 10.25\% & \xrightarrow{\times 5} & 51.25 \end{array}$$

- 15) The difference between simple interest and compound on Rs. 1200 for one year at 10% per annum. calculate half-yearly is:

one year \rightarrow 2 times

10% 1 yr \Rightarrow 5% 6 months



16 The difference between compound interest and simple interest on an amount of Rs. 15,000 for 2 years is Rs. 96. What is the rate of interest?

Per annum :-

For 2 year formula :-

$$CI - SI = P \left(\frac{R}{100} \right)^2$$

$$96 = 15000 \times R^2$$

$$\frac{96 \times 100}{15000} = R^2$$

$$R = 8\%$$

17 The compound interest on a certain sum for 2 years at 10% per annum is Rs. 525. The simple interest on the same sum for double the time at half the rate percent per annum is :-

$$10\%, 2 \text{ yrs} \Rightarrow CI = 21\% \rightarrow 525$$

double the time and half the rate :-

$$4 \text{ yrs} \times 5\% \Rightarrow 20\% \times 25 \rightarrow 500$$