EXERCISE NO. 3

-:3.1:-

If Rs. 10,000 is invested for 6 years at an annual simple interest rate of 16%.

a) How much interest will be earned?

b) What is the amount of the investment at the end of the 6 years.

SOLUTION

Here Principal = Rs. 10000, rate = 16%, Time = 6 years

(a)

$$\text{Simple Interest} = I = \frac{P \times r \times t}{100}$$

$$= \frac{10000 \times 16 \times 6}{100} = \text{Rs. } 9600$$

(b)

$$\text{Amount} = \text{Principal} + \text{Simple Interest} = P + I$$

$$= \text{Rs.}10000 + \text{Rs.}9600 = \text{Rs. } 19600$$

-:3.2:-

Find the simple interest and amount for the following:

i) Rs. 2000 for 3 years at 5%. **ii) Rs. 800 for 7 years at 4%.**

iii) Rs. 4000 for 5 years at 6%.

SOLUTION

(i) Principal = Rs. 2000, Rate = 5%

Time = 3 years

$$\text{Simple Interest} = I = \frac{P \times r \times t}{100} = \frac{2000 \times 5 \times 3}{100} = \text{Rs. } 300$$

Amount = A = Principal + Simple Interest

= Rs. 2000 + Rs. 300 = Rs. 2300

(ii) Principal = Rs. 800, Rate = 4%,

Time = 7 years

$$\text{Simple Interest} = I = \frac{P \times r \times t}{100} = \frac{800 \times 4 \times 7}{100} = \text{Rs. } 224$$

Amount = Principal + Simple Interest

= Rs. 800 + Rs. 224 = Rs. 1024

(iii) Principal = Rs. 4000, Rate = 6%, Time = 5 years

$$\text{Simple Interest} = I = \frac{P \times r \times t}{100} = \frac{4000 \times 6 \times 5}{100} = \text{Rs. } 1200$$

Amount = Principal + Simple Interest

= Rs. 4000 + Rs. 1200 = Rs. 5200

-:3.3:-

Mr. Asghar borrowed Rs. 5000 for 5 years at 8% simple interest. How much he will repay?

SOLUTION

Principal = Rs. 5000, Rate = 8%, Time = 5 years

$$\text{Simple Interest} = I = \frac{P \times r \times t}{100} = \frac{5000 \times 8 \times 5}{100} = \text{Rs. } 2000$$

Mr. Asghar will repay

Amount = Principal + Simple Interest

= Rs. 5000 + Rs. 2000 = Rs. 7000

-:3.4:-

Mr. Bashir Ahmad borrowed Rs. 4500 from Habib Bank at 8½% and lent the whole amount at 10% the same day, what would he gained from this after 4 years.

SOLUTION

Principal = Rs. 4500

$$\text{Rate} = 8\frac{1}{2}\% = \frac{17}{2}\%$$

Time = 4 years

$$\text{Simple Interest} = I = \frac{P \times r \times t}{100} = \frac{4500 \times 17 \times 4}{100 \times 2} = \text{Rs. } 1530$$

Mr. Bashir lented = Rs. 4500, Rate = 10%, Time= 4 year

$$\text{Simple Interest} = \frac{4500 \times 10 \times 4}{100} = \text{Rs. } 1800$$

He will gain = Rs. 1800 - Rs. 1530 = Rs. 270

-:3.5:-

Khalid Mahmood borrowed Rs. 2500 from Sultan for 3½ years at simple interest at 8% per annum. How much Khalid Mahmood has to pay at the end of the period.

SOLUTION

Principal = Rs. 2500, Rate = 8%

$$\text{Time} = 3\frac{1}{2}\text{ years} = \frac{7}{2}\text{ years} = 4\text{ years}$$

$$\text{Simple Interest} = I = \frac{P \times r \times t}{100} = \frac{2500 \times 8 \times 7}{100 \times 2} = \text{Rs. } 700$$

He will pay = Rs. 2500 + Rs. 700 = Rs. 3200

-:3.6:-

What sum would borrow in Rs. 1250 as simple interest at 3% in 3 years.

SOLUTION

Simple Interest = Rs. 1250, Rate = 3%, Time = 3 years

$$\text{Principal} = P = \frac{I \times 100}{r \times t} = \frac{1250 \times 100}{3 \times 3}$$

$$= \text{Rs. } 13888.89 = \text{Rs. } 13889$$

-:3.7:-

Find the principal, if the amount for 5 years at 5% is Rs. 5550.

SOLUTION

Here Amount = Rs. 5550, Rate = 5%, Time = 5 years

$$\text{Principal} = P = \frac{A \times 100}{100 + (r + t)}$$

$$= \frac{5550 \times 100}{100 + (5 \times 5)} = \frac{555000}{125} = \text{Rs. } 4440$$

-:3.8:-

How much should Mr. Arif borrow from Mr. Hanif so that he may have to repay Rs. 4425 after 3 years if Hanif charges a simple interest rate 5%.

SOLUTION

Here Amount = Rs. 4425, Rate = 5%, Time = 3 years
We have

$$\text{Principal} = P = \frac{A \times 100}{100 + (r + t)}$$

$$= \frac{4425 \times 100}{100 + (5 \times 3)} = \frac{442500}{115} = \text{Rs. } 3847.83 = \text{Rs. } 3848$$

-:3.9:-

How much should Mr. Maqbool borrows from a bank so that he may have to repay Rs. 2800 after 2 years if the bank charges a simple interest rate 4%.

SOLUTION

Here Amount = Rs. 2800, Rate = 4%, Time = 2 years
We have

$$\text{Principal} = P = \frac{A \times 100}{100 + (r + t)}$$

$$= \frac{2800 \times 100}{100 + (4 \times 2)} = \frac{280000}{108} = \text{Rs. } 2592.59 = \text{Rs. } 2593$$

-:3.10:-

Find the sum of money that amount to Rs. 2775 in five years Nine months at 4%.

SOLUTION

Here Amount = Rs. 2775, Rate = 4%,
Time = 5 years and 9 month.

$$5 + \frac{9}{12}\text{ year} = 5\frac{3}{4}\text{ year} = \frac{23}{4}\text{ year}$$

We have

$$\text{Principal} = P = \frac{A \times 100}{100 + (r + t)}$$

$$= \frac{2775 \times 100}{100 + (4 \times \frac{23}{4})} = \frac{2775 \times 100}{100 + 23} = \frac{277500}{123}$$

$$\text{Principal} = P = \text{Rs. } 2256.097 = \text{Rs. } 2256$$

-:3.11:-

At what rate of interest, would Rs. 1800 amount to Rs. 2500 in 2 years.

SOLUTION

Here Principal = P = Rs. 1800 and Amount = A = Rs. 2500

Simple Interest = Amount - Principal

= Rs. 2500 - Rs. 1800 = Rs. 700

Time = 2 years

We have

$$\text{Rate} = r = \frac{I \times 100}{P \times t} = \frac{700 \times 100}{1800 \times 2} = 19.44\%$$

-:3.12:-

Find the rate percent of interest, if the simple interest on Rs. 21540 for 4 years 9 months is Rs. 5000.

SOLUTION

Here Simple Interest = I = Rs. 5000

Principal = P = Rs. 21540

Time = 4 years and 9 months

$$4\frac{9}{12}\text{ years} = 4\frac{3}{4}\text{ years} = \frac{19}{4}\text{ years}$$

We have

$$\text{Rate} = r = \frac{I \times 100}{P \times t}$$

$$= \frac{5000 \times 100 \times 4}{21540 \times 19} = \frac{2000000}{409260} = 4.89\%$$

-:3.13:-

At what rate of interest would a sum of money becomes one and a half in 10 years.

SOLUTION

Suppose Sum = Rs. 100

Simple I becomes one and half itself, so Amount A = Rs. 150

Simple Interest = Rs. 150 - Rs. 100 = Rs. 50

Time = 10 years

Hence

$$\text{Rate} = r = \frac{I \times 100}{P \times t} = \frac{50 \times 100}{100 \times 10} = 5\%$$

-:3.14:-

How long will it take for Rs. 1000 to amount Rs. 1180 at 6% per annum simple interest.

SOLUTION

We know that

Amount = Principal + Simple Interest

$A = P + I$

$I = A - P$

Amount = Rs. 1180, Principal = Rs. 1000

Simple Interest = Rs. 1180 - Rs. 1000 = Rs. 180

Rate = 6%

$$\text{Time} = t = \frac{I \times 100}{P + r} = \frac{180 \times 100}{1000 \times 6} = 3 \text{ years}$$

-:3.15:-

In how many years would a sum lent at 8% be doubled.

SOLUTION

Suppose the sum = Rs. 100, Amount = Rs. 200

Simple Interest = I = Rs. 200 - Rs. 100, Rate = r = 8%

Hence

$$\text{Time} = t = \frac{I \times 100}{P \times r} = \frac{100 \times 100}{100 \times 8} = 12\frac{1}{2} \text{ years}$$

-:3.16:-

Find the compound interest on Rs. 8000 for 3 years at 5% per annum.

SOLUTION

Principal = Rs. 8000, Rate = r = 5%, Time = n = 3 years

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

$$\text{Amount} = 8000\left(1+\frac{5}{100}\right)^3 = 8000\left(\frac{105}{100}\right)^3$$

$$= 8000\,(1.05)^3 = 8000\,(1.157625) = \text{Rs. } 9261$$

Compound Interest = Rs. 9261 - Rs. 8000 = Rs. 1261

-:3.17:-

Find the amount at compound interest of Rs. 12000 at 6% per annum for 2 years and 6 months. Also find the compound interest.

SOLUTION

Principal = Rs. 12000, Rate = r = 6%

Time = n = 2 years 6 months

The number of six month periods in 2 years 6 month are 5, 6% per annum compounded semi-annually is equivalent to 3% every six months. So,

Here n = 5 six months periods

Rate = 3% compounded semi-annually

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

$$= 12000\left(1+\frac{3}{100}\right)^5 = 12000\left(\frac{103}{100}\right)^5$$

$$= 12000\,(1.03)^5 = 12000\,(1.15927074)$$

$$= \text{Rs. } 13911.28889 = \text{Rs. } 13911.29$$

-:3.18:-

Find the compound amounts and compound interest for the given investments.

a) Rs. 5000 at 5% compounded annually for ten years.

b) Rs. 5000 at 5% compounded semi annually for ten years.

c) Rs. 5000 at 5% compounded quarterly for ten years.

d) Rs. 8000 at 8% compounded annually for ten years.

e) Rs. 8000 at 8% compounded semi annually for ten years.

f) Rs. 8000 at 8% compounded quarterly for ten years.

SOLUTION

(a) Principal = P = 5000, Rate = r = 5% Compounded annually
Time = n = 10 years

$$\text{Amount} = P\left(1+\frac{r}{100}\right)^n = 5000\left(1+\frac{5}{100}\right)^{10}$$

$$= 5000\left(\frac{105}{100}\right)^{10} = 5000(1.05)^{10}$$

$$= 5000(1.628894627) = \text{Rs. } 8144.47$$

Hence Amount = Rs. 8144.47 and Interest = Rs. 3144.47

(b) Principal = P = 5000, Rate = r = 5% Compounded annually
Time = n = 20 six months periods semi-annually

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

$$= 5000\left(1+\frac{25}{100}\right)^{20} = 5000\,(1+0.025)^{20}$$

$$= 5000\,(1.163861644) = \text{Rs. } 8193.08$$

Hence Amount = Rs. 8193.08 and Interest = Rs. 3193.08

(c) Principal = P = 5000, Rate = r = 5% per annum
Five percent compounded quarterly = $^{0.05}/_4 = 0.0125$ per quarter.
Since there are four quarters in a year, the number of interest periods is n = 40 quarters. Hence the compound amount is:

$$\text{Amount} = P\left(1+\frac{r}{100}\right)^n = 5000\left(1+\frac{1.25}{100}\right)^{40}$$

$$= 5000\,(1+0.0125)^{40} = 5000\,(1.0125)^{40}$$

$$= 5000(1.643619463) = \text{Rs. } 8218.10$$

Hence Amount = Rs. 8218.10 and Interest = Rs. 3218.10

(d) Principal = P = 8000, Rate = r = 8% per annum
Time = n = 10 years

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

$$\text{Amount} = 8000\left(1+\frac{8}{100}\right)^{10} = 8000\left(\frac{108}{100}\right)^{10}$$

$$= 8000(1.08)^{10} = 8000\ (2.158924997) = \text{Rs. } 17271.40$$

Hence Amount = Rs. 17271.40 and Interest = Rs. 9271:40

(e) Principal = P = 8000, Rate = r = 8% per annum
8% compounded semi-annually is $^{8}/_{2}\% = 4\%$ each six month.
There are 20 six month periods i.e. n = 20

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

$$= 8000\left(1+\frac{4}{100}\right)^{20} = 8000\left(\frac{104}{100}\right)^{20}$$

$$= 8000(1.04)^{20} = 8000\ (2.191123143)$$

$$= \text{Rs. } 17528.99$$

Hence Amount = Rs. 17528.99 and Interest = Rs. 9528.99

(f) Principal = P = 8000, Rate = r = 8% per annum
8% compounded quarterly is $^{8\%}/_{4} = 2\%$ per quarter.
There are 40 quarters in 10 years. So n = 40 quarters.

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

$$= 8000\left(1+\frac{2}{100}\right)^{40} = 8000\left(\frac{102}{100}\right)^{40}$$

$$= 8000(1.02)^{40} = 8000\ (2.208039664)$$

$$= \text{Rs. } 17664.32$$

Hence Amount = Rs. 17664.32 and Interest = Rs. 9664.32

-:3.19:-

A man deposits Rs. 5000 at the time of his son's birth, in an investment that pays 4% compounded semi annually. How much will be on deposit on the son's 21st birthday.

SOLUTION

Principal = P = 5000, Rate = r = 4%
r = 2% Compounded semi-annually

Time = n = 21 years = 42 six month periods

$$\text{Amount} = P\left(1+\frac{r}{100}\right)^{n} = 5000\left(1+\frac{2}{100}\right)^{42}$$

$$= 5000\,(1.02)^{42}$$

Let $x = (1.02)^{42}$

taking log of both sides

$\log x = 42 \log (1.02)$

$\log x = 42\,(0.0086001717)$

$\log x = 0.361207214$

taking antilog of both sides

$x = 2.29724466$

Hence Amount = 5000 (2.29724466) = Rs. 11448.62

-:3.20:-

Mr. Aslam has invested Rs. 25000 at 6% compounded annually. What amount would be received after 4 years.

SOLUTION

Principal = P = 25000, Rate = r = 6%, Time = n = 4 years

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

$$= 25000\left(1+\frac{6}{100}\right)^{4} = 25000\left(\frac{106}{100}\right)^{2}$$

$$\text{Amount} = 25000\,(1.06)^{4} = 25000\,(1.26247696)$$

$$= \text{Rs. } 31561.92$$

-:3.21:-

On a saving bank account Bank-A pays 3% interest compounded annually, while Bank-B pays 6% interest compounded semi annually on a deposit of Rs. 2000, how much more interest will be earned in 3 years at Bank-B as compared to Bank-A.

SOLUTION

Principal = P = 2000

Bank A:-

Principal = P = Rs. 2000, Rate = 3%, Time = 3 years

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

$$= 2000\left(1+\frac{6}{100}\right)^3 = 2000\left(\frac{106}{100}\right)^3$$

$$= 2000\,(1.06)^3 = 2000\,(1.092727) = \text{Rs. } 2185.45$$

Bank B:-

Principal = P = Rs. 2000

The number of six months periods in 3 years are 6 and 6% per annum compounded semi-annually is equal to 3% every six months. So,

Rate = 3% Compounded semi-annually, Time = n = 6

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

$$= 2000\left(1+\frac{3}{100}\right)^6 = 2000\left(\frac{103}{100}\right)^6$$

$$= 2000\,(1.03)^6 = 2000\,(1.194052297) = \text{Rs. } 2388.10$$

Bank B will earn more than Bank A

= Rs. 2388.10 - Rs. 2185.45 = Rs. 202.65

-:3.22:-

Find the principal of Rs. 9628.20 due at the end of 8 years if money is worth 6% compounded semi annually.

SOLUTION

We have to find principal

Time = n = 8 x 2 = 16 six month periods

Rate = r = 6% per annum = 3% Semi annually

Amount = Rs. 9628.20

$$P = \frac{A}{\left(1+\frac{r}{100}\right)^n} = \frac{9628.20}{\left(1+\frac{3}{100}\right)^{16}} = \frac{9628.20}{(1+0.03)^{16}} = \frac{9628.20}{(1.03)^{16}}$$

Let $x = (1.03)^{16}$

Taking log of both sides

$\log x = 16 \log (1.03)$

$\log x = 16 (0.012837224)$

$\log x = 0.205395584$

Taking antilog of both sides

$x = 1.604706397$

Hence $$P = \frac{9628.20}{1.604706397} = \text{Rs. } 6000$$

-:3.23:-

The compound interest for 5 years at 5% is Rs. 1000. Find the principal.

SOLUTION

Compound Interest = Rs. 1000, Rate = 5%, Time = 5 years

We have to find principal, Suppose

Principal = P = Rs. 100

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

$$= 100\left(1+\frac{5}{100}\right)^5 = 100\left(\frac{105}{100}\right)^5$$

$$= 100\,(1.05)^5 = 100\,(1.276281563)$$

$$= \text{Rs. } 127.7281563 = \text{Rs. } 127.63$$

Compound Interest = Amount - Principal

= Rs. 127.63 - Rs. 100 = Rs. 27.63

If C-I is Rs. 27.63, Principal = Rs. 100

If C-I is Rs. 1000, then

$$P = \frac{100 \times 1000}{27.63} = \text{Rs. } 3619.25$$

-:3.24:-

In how many years a sum of Rs. 1000 would amount Rs. 1350 at 4% compounded interest.

SOLUTION

Principal = Rs. 1000, Amount = Rs. 1350, Rate = 4%

We have to find n

$$n = \frac{\log A - \log P}{\log\left(1 + \frac{r}{100}\right)}$$

$$= \frac{\log 1350 - \log 1000}{\log\left(1 + \frac{4}{100}\right)} = \frac{\log 1350 - \log 1000}{\log(1.04)}$$

$$= \frac{3.13033 - 3.00000}{0.01703} = \frac{0.13033}{0.01703} = 7.65 \text{years}$$

-:3.25:-

In how many years a sum of Rs. 5560 would amount Rs. 7000 at 8% interest compounded semi annually.

SOLUTION

Principal = P = Rs. 5560, Amount = A = Rs. 7000

Rate = 8% per annum = 4% semi-annually

We have to find n

$$n = \frac{\log A - \log P}{\log\left(1 + \frac{r}{100}\right)}$$

$$= \frac{\log 7000 - \log 5560}{\log\left(1 + \frac{4}{100}\right)} = \frac{\log 7000 - \log 5560}{\log(1.04)}$$

$$= \frac{3.84509 - 3.74507}{0.01703} = \frac{0.10002}{0.01703}$$

n = 5.87 = 6 periods of six months = 3 years.

-:3.26:-

In how many years a sum of Rs. 3000 would amount Rs. 6130.43 at 6% compounded quarterly.

SOLUTION

Principal = P = Rs. 3000, Amount = A = Rs. 6130.43

Rate = 6% per annum

6% compounded quarterly = $^{6\%}/_{4} = 1.5\%$

We have to find n

$$n = \frac{\log A - \log P}{\log\left(1 + \frac{r}{100}\right)} = \frac{\log 6130.43 - \log 3000}{\log\left(1 + \frac{1.5}{100}\right)}$$

$$= \frac{\log 6130.43 - \log 3000}{\log(1.015)} = \frac{3.78749038 - 3.477121255}{0.006466042}$$

$$= \frac{0.310369683}{0.006444042} = 47.9999485 = 48 \text{ quarters} = 12 \text{ years}$$

-:3.27:-

At what rate of interest compounded per annum for 5 years will Rs. 2000 amount to Rs. 2250.

SOLUTION

Here Principal = P = Rs. 2000

Amount = A = Rs. 2550

n = 5 years.

We have to find the value of r.

$$\frac{r}{100} = \text{Anti log}\left[\frac{1}{n}(\log A - \log P)\right] - 1 \Rightarrow \frac{r}{100} = \text{Anti log}\left[\frac{\log A - \log P}{n}\right] - 1$$

$$\frac{r}{100} = \text{Anti log}\left[\frac{\log 2550 - \log 2000}{5}\right] - 1$$

$$\frac{r}{100} = \text{Anti log}\left[\frac{3.40654 - 3.30103}{5}\right] - 1 \Rightarrow \frac{r}{100} = \text{Anti log}\left[\frac{0.10551}{5}\right] - 1$$

$$\frac{r}{100} = \text{Anti log}(0.021102) - 1 = 1.049788957 - 1$$

$$r = 4.9788957\% = 5\%$$

-:3.28:-

At what rate of interest compounded quarterly for 2½ years will Rs. 2500 amount to Rs. 3900

SOLUTION

Principal = P = Rs. 2500, Amount = A = Rs. 3900

n = 2½ years = 10 periods of three months as interest compounded is quarterly

We have to find the value of r.

$$\frac{r}{100} = \text{Anti log}\left[\frac{1}{n}(\log A - \log P\right] - 1$$

$$\frac{r}{100} = \text{Anti log}\left[\frac{\log 3900 - \log 2500}{10}\right] - 1$$

$$\frac{r}{100} = \text{Anti log}\left[\frac{3.59106 - 3.39794}{10}\right] - 1 \Rightarrow \frac{r}{100} = \text{Anti log}\left[\frac{0.19312}{10}\right] - 1$$

$$\frac{r}{100} = \text{Anti log}(0.019312) - 1 = 1.04547 - 1$$

r = 4.547% quarterly = 18.18% per annum

-:3.29:-

What is the difference between the compound and simple interest of Rs. 15625 for 4 years at 4%.

SOLUTION

Principal = P = Rs. 15625, Rate = r = 4%, Time = n = 4 years

$$\text{Simple Interest} = I = \frac{P \times r \times t}{100} = \frac{15625 \times 4 \times 4}{100}$$

Simple Interest = Rs. 2500

Compound Interest

$$\text{Amount} = P\left(1 + \frac{r}{100}\right)^n = 15625\left(1 + \frac{4}{100}\right)^4 = 15625\left(\frac{104}{100}\right)^4$$

$$= 15625\,(1.04)^4 = 15625(1.16985856) = \text{Rs. } 18279.04$$

Compound Interest = Amount - Principal

= Rs. 18279.04 - Rs. 15625 = Rs. 2654.04

Difference between simple and compound interest

= Rs. 2654.04 - Rs. 2500 = Rs. 154.04

-:3.30:-

If the difference between the simple and compound interest for 3 years at 5% is Rs. 61. Find the principal.

SOLUTION

Let the Principal = P = Rs. 100, Rate = r = 5%, Time = n = 3 years

$$\text{Simple Interest} = I = \frac{P \times r \times t}{100} = \frac{100 \times 5 \times 3}{100} = \text{Rs. } 15$$

Compound Interest

$$\text{Amount} = P\left(1+\frac{r}{100}\right)^n = 100\left(1+\frac{5}{100}\right)^3$$

$$= 100\,(1.05)^3 = 100\,(1.157625) = \text{Rs. } 115.76$$

Compound interest = Rs. 115.76 - Rs. 100 = Rs. 15.76

Difference between simple and compound interest

= Rs. 15.76 - Rs. 15 = Rs. 0.76

If difference is Rs. 0.76, then principal = Rs. 100

If difference is Rs. 61, then

$$\text{Principal} = \frac{100 \times 61}{0.76} = \text{Rs. } 8026.32$$

-:3.31:-

The difference between the simple and compound interest on a certain sum is Rs. 2.50 for 2 years at 5%. Find the sum.

SOLUTION

Let the Principal = P = Rs. 100, Rate = r = 5%, Time = n = 2 years

$$\text{Simple Interest} = I = \frac{P \times r \times t}{100} = \frac{100 \times 5 \times 2}{100} = \text{Rs. } 10$$

Compound Interest

$$\text{Amount} = P\left(1+\frac{r}{100}\right)^n = 100\left(1+\frac{5}{100}\right)^2 = 100\left(\frac{105}{100}\right)^2$$

$$= 100\,(1.05)^2 = 100\,(1.1025) = \text{Rs. } 110.25$$

Compound interest = Rs. 110.25 - Rs. 100 = Rs. 10.25

Difference between simple and compound interest

= Rs. 10.25 - Rs. 10 = Rs. 0.25

If difference is Rs. 0.25, then principal = Rs. 100

If difference is Rs. 2.5, then

$$\text{Principal} = \frac{100 \times 2.50}{0.25} = \text{Rs. } 1000$$