

Partnership

When two or more people invest their money in a business, persons are called Partners, their relationship is Partnership and money is Capital.

- If they invest money for the same time, it is called a Simple partnership.
- If they invest money for a different time, it is called a Compound partnership.

Partnership Problems

Profit is directly proportional to Time and Investments.

Profit \propto Time **Profit \propto Investments**
Profit \propto (Time \times Investments)

Example 1:

Three partners A, B, and C invest Rs.1500, Rs.1200, and Rs.1800 respectively in a company. How should they divide a profit of Rs.900?

Solution: Given, there is no time given, we can say profit is proportional to investment.

Ratio of profit = ratio of investment

Profit ratio of A:B:C = 1500:1200:1800 = 5:4:6

so, total profit is $5+4+6 = 15$ i.e. equal to 900

profit of A = $(5/15) \times 900 = 300$

profit of B = $(4/15) \times 900 = 240$

profit of C = $(6/15) \times 900 = 360$

Example 2:

In a company, A invested Rs.1500 for 4 months and B invested Rs.1200 for 6 months and C invested Rs.3600 for 2 months. If a company has a profit of Rs.680. What will be the share of A, B, and C?

Solution:

Ratio of profit A:B:C = $(1500 \times 4):(1200 \times 6):(3600 \times 2)$
 $= 60:72:72$
 $= 5:6:6$

total profit is $5+6+6 = 17$ i.e. equal to 680.

we can say, $17 = 680$

$1 = 40$

profit of A is 5, so $5 \times 40 = 200$

profit of B is 6, so $6 \times 40 = 240$

profit of C is 6, so $6 \times 40 = 240$

Note: Read questions carefully. If we can calculate capital invested and the time for which capital is invested. We can easily calculate shares in profit.

Example 3:

A and B enter into a partnership with Rs.50000 and Rs.75000 respectively in a company for a year. After 7 months, C gets into a partnership with them with Rs.30000 and A withdraws his contribution after 9 months. How would they share their profit of Rs.2600 at the end of the year?

Solution: A, B, and C do business for 1 year but, A contributed Rs.50000 for 9 months, B contributed 75000 for 12 months and C invested Rs.30000 **for 5 months, not for 7 months.**

$$\begin{aligned}\text{So the ratio of profit } A:B:C &= 50 \times 9 : 75 \times 12 : 30 \times 5 \\ &= 15 : 30 : 5\end{aligned}$$

Hence total profit is $(15+30+5) = 50$ which is equal to 2600

$$\text{So share of A} = (15/50) \times 2600 = 780$$

$$\text{share of B} = (30/50) \times 2600 = 1560$$

$$\text{share of C} = (5/50) \times 2600 = 260$$

Example 4:

A, B and C started a company in which A invested $(1/3)^{\text{rd}}$ of the capital for $(1/4)^{\text{th}}$ of the time, B invested $(1/2)^{\text{nd}}$ of the capital for $(1/6)^{\text{th}}$ of the time and C invested the remaining capital for the whole of the time. If the profit at the end of the year is Rs.1200. How would they share it?

Solution: A invested $(1/3)^{\text{rd}}$ of the capital and B invested $(1/2)^{\text{nd}}$ of the capital

$$\text{So, remaining capital invested by C} = 1 - ((1/3) + (1/2)) = 1/6$$

$$\begin{aligned}\text{The ratio of profit } A : B : C &= (1/3) \times (1/4) : (1/2) \times (1/6) : (1/6) \times 1 \\ &= (1/12) : (1/12) : (1/6) \\ &= 1 : 1 : 2\end{aligned}$$

$$\text{A's share} = (1/4) \times 1200 = 300$$

$$\text{B's share} = (1/4) \times 1200 = 300$$

$$\text{C's share} = (1/2) \times 1200 = 600$$

Example 5:

A and B rent a field for 11 months. A puts 100 bags for 9 months. How many bags can be put by B for 3 months if the ratio of their rent is 2:3?

Solution: Let B puts X bags.

the ratio of rent of A: B is 2: 3

$$\text{so, } (100 \times 9) : (X \times 3) = 2 : 3$$

$$X = 450 \text{ bags}$$

Example 6:

If A and B entered into a partnership and invested their capital in the ratio of 19:15. At the end of 19 months, B withdraws his capital. If they share profit in the ratio of 3:2, then for how many months A invested his ratio?

Solution: Let A invested for X months.

Ratio of profit A : B = $X \times 19$: 19×15

So, $19X : 19 \times 15 = 3:2$

$X = 22(1/2)$ months

Example 7:

Sandeep, Vineet and Shekhar are three partners. Sandeep receives $1/5$ of the profit and Vineet and Shekhar share the remaining profit equally. If Vineet's income is increased by Rs.650 when the profit rises from 10% to 15%. Find the capitals invested by Sandeep, Vineet and Shekhar and total capital invested.

Solution: As given, the profit share of Sandeep is $1/5$, remaining profit $(1 - 1/5) = 4/5$ is shared between Vineet and Shekhar equally.

So, the profit share of Vineet = $2/5$ and profit share of Shekhar = $2/5$

when profit % increases, Vineet's income increase by Rs.650

$(15\% - 10\%) = 5\% = 650$

$100\% = 13000$

So, Vineet's capital = 13000

i.e $(2/5)$ of total capital = 13000

total capital = 32500

and Shekhar's capital = 13000

Sandeep's capital i.e $(1/5)$ of total capital or $1/2$ of (Vineet or Shekhar's Capital) = 6500

Example 8:

A and B are partners in a business. They invest in the ratio 5: 6, at the end of 8 months B withdraws. If they receive profits at the end of the year in the ratio of 5: 9, find how long A's investment was used? (SBI PO Pre 2016 Memory based)

Solution: Let A's investment used for X months.

Given, the ratio of invest (A: B) = 5: 6

ratio of time = X : 8

the ratio of profit = $5X : 6 \times 8$ and given ratio of profit = 5: 9

so $5X/48 = 5/9$

$X = 48/9$

$X = 16/3$ months

Example 9:

A, B, and C started a business with their investments in the ratio 1: 2: 4. After 6 months A invested the half amount more as before and B invested the same amount as before while C withdrew $(1/4)^{\text{th}}$ of his investment after the 9 months. Find the ratio of their profits at the end of the year. (SBI Clerk Mains)

Solution: Ratio of investments A:B:C = 1:2:4, there are no changes in the investment of A and B up to 6 months and in the investment of C up to 9 months.

At the end of 6 months, A invested half the amount more as before so A's investment = $1 + (1/2)$

Similarly B invest the same amount more as before = $2 + 2 = 4$

But, C withdraw the $(1/4)^{\text{th}}$ of the amount after 9 months = $4 - 1 = 3$

$$\begin{aligned} \text{ratio of profit} &= (1 \times 6 + (3/2) \times 6) : (2 \times 6 + 4 \times 6) : (4 \times 9 + 3 \times 3) \\ &= 15 : 36 : 45 \\ &= 5 : 12 : 15 \end{aligned}$$

Example 10:

A sum of money is divided amongst P, Q and R in the ratio of 3: 4: 5. Another amount is divided amongst A and B in the respective ratio of 2: 1. If B got Rs. 1050 less than Q, what is the amount received by R?

Solution: Let the sum of money divided amongst P, Q and R is $3x$, $4x$ and $5x$ respectively and the sum of money divided amongst A and B is $2y$ and y respectively.

$$4x - y = 1050$$

another relation between x and y cannot be established. So, it cannot be determined.

Directions (12-15): In the following table, the investments and profit of three persons is given for different years in a joint business.

Year	Investments (In Rs.)			Profit (In Rs.)		
	A	B	C	A	B	C
2010	15000	-----	23000	-----	82500	115000
2011	-----	6000	----	----	15000	17500
2012	-----	-----	18000	42000	27000	24000
2013	-----	17000	10000	----	-----	14000
2014	11000	20000	----	----	----	----

Note:

1. Except for the year 2012, they invested the amounts for the same period.
2. Some values are missing. You have to calculate these values per given data.

Example 11:

If the total profit in 2011 is 45000, then find the ratio of the investment of B in 2010 to the investment of A in 2011.



Solution: profit of A in 2011 is $45000 - (15000 + 17500) = 12500$
B makes the profit of 15000 by investing 6000
So, investment of A in 2011 = $(6000/15000) \times 12500 = 5000$
In 2010, 23000 investment of C makes the profit of Rs.115000
So, investment of B = $(23000/115000) \times 82500 = 16500$
required ratio of (B:A) is $16500:5000 = 33:10$

Example 12:

If the total investment in 2014 is 46000, then the ratio of profit in 2014 is?

Solution: investment of C is $46000 - (20000 + 11000) = 15000$
The time period is the same, so the ratio of profit will be also the same as the ratio of investment = 11:20:15

Example 13:

In the year 2012 total investment of A and B is 30000, A and B invested their amount for 4 months and 6 months respectively then find the number of months that C invested his amount?

Solution: ratio of profit (A:B) = 42000: 27000

$$A \times 4 : B \times 6 = 42000 : 27000$$

$$A : B = 21 : 9 = 7 : 3$$

So, investment of A is 21000 and investment of B is 9000.
let C invest 18000 for X months.

So, $(18000 \times X) : (21000 \times 4) = 24000 : 42000$

$X = (8/3)$ months, Hence C invested for $8/3$ months.