

13. PARTNERSHIP

!IMPORTANT FACTS AND FORMULAE !

1. Partnership: When two or more than two persons run a business jointly, they are called partners and the deal is known as *partnership*.

2. Ratio of Division of Gains:

i) When investments of all the partners are for the same *time*, the gain or loss is distributed among the partners in the ratio of their investments.

Suppose A and B invest Rs. x and Rs. y respectively for a year in a business, then at the end of the year:

(A's share of profit) : (B's share of profit) = $x : y$.

ii) *When investments are for different time periods*, then equivalent capitals are calculated for a unit of time by taking (capital \times number of units of time). Now, gain or loss is divided in the ratio of these capitals.

Suppose A invests Rs. x for p months and B invests Rs. y for q months, then

(A's share of profit) : (B's share of profit) = $xp : yq$.

3. Working and Sleeping Partners: A partner who manages the business is known as a *working partner* and the one who simply invests the money is a *sleeping partner*.

SOLVED EXAMPLES

Ex. 1. A, B and C started a business by investing Rs. 1,20,000, Rs. 1,35,000 and Rs. 1,50,000 respectively. Find the share of each, out of an annual profit of Rs. 56,700.

Sol. Ratio of shares of A, B and C = Ratio of their investments
 $= 120000 : 135000 : 150000 = 8 : 9 : 10$.

A's share = Rs. $(56700 \times \frac{8}{27}) =$ Rs. 16800.

B's share = Rs. $(56700 \times \frac{9}{27}) =$ Rs. 18900.

C's share = Rs. $(56700 \times \frac{10}{27}) =$ Rs. 21000.

Ex. 2. Alfred started a business investing Rs. 45,000. After 3 months, Peter joined him with a capital of Rs. 60,000. After another 6 months, Ronald joined them with a capital of Rs. 90,000. At the end of the year, they made a profit of Rs. 16,500. Find the share of each.

Sol. Clearly, Alfred invested his capital for 12 months, Peter for 9 months and Ronald for 3 months.

$$\begin{aligned}\text{So, ratio of their capitals} &= (45000 \times 12) : (60000 \times 9) : (90000 \times 3) \\ &= 540000 : 540000 : 270000 = 2 : 2 : 1.\end{aligned}$$

$$\text{Alfred's share} = \text{Rs. } (16500 \times (2/5)) = \text{Rs. } 6600$$

$$\text{Peter's share} = \text{Rs. } (16500 \times (2/5)) = \text{Rs. } 6600$$

$$\text{Ronald's share} = \text{Rs. } (16500 \times (1/5)) = \text{Rs. } 3300.$$

Ex. 3. A, Band C start a business each investing Rs. 20,000. After 5 months A withdrew Rs.6000 B withdrew Rs. 4000 and C invests Rs. 6000 more. At the end of the year, a total profit of Rs. 69,900 was recorded. Find the share of each.

Sol. Ratio of the capitals of A, Band C

$$\begin{aligned}&= 20000 \times 5 + 15000 \times 7 : 20000 \times 5 + 16000 \times 7 : 20000 \times 5 + 26000 \times 7 \\ &= 205000 : 212000 : 282000 = 205 : 212 : 282.\end{aligned}$$

$$A's \text{ share} = \text{Rs. } 69900 \times (205/699) = \text{Rs. } 20500 \quad \text{I}$$

$$B's \text{ share} = \text{Rs. } 69900 \times (212/699) = \text{Rs. } 21200;$$

$$C's \text{ share} = \text{Rs. } 69900 \times (282/699) = \text{Rs. } 28200.$$

Ex. 4. A, Band C enter into partnership. A invests 3 times as much as B and B invests two-third of what C invests. At the end of the year, the profit earned is Rs. 6600. What is the share of B ?

Sol. Let C's capital = Rs. x. Then, B's capital = Rs. $(2/3)x$

$$A's \text{ capital} = \text{Rs. } (3 \times (2/3).x) = \text{Rs. } 2x.$$

$$\text{Ratio of their capitals} = 2x : (2/3)x : x = 6 : 2 : 3.$$

$$\text{Hence, B's share} = \text{Rs. } (6600 \times (2/11)) = \text{Rs. } 1200.$$

Ex. 5. Four milkmen rented a pasture. A grazed 24 cows for 3 months; B 10 for 5 months; C 35 cows for 4 months and D 21 cows for 3 months. If A's share of rent is Rs. 720, find the total rent of the field.

Sol. Ratio of shares of A, B, C, D = $(24 \times 3) : (10 \times 5) : (35 \times 4) : (21 \times 3) = 72 : 50 : 140 : 63.$

Let total rent be Rs. x . Then, A 's share = Rs. $(72x)/325$
 $(72x)/325=720 \Leftrightarrow x=(720 \times 325)/72 = 3250$

Hence, total rent of the field is Rs. 3250.

Ex.6. A invested Rs. 76,000 in a business. After few months, B joined him Rs. 57,000. At the end of the year, the total profit was divided between them in ratio 2 : 1. After how many months did B join?

Sol. Suppose B joined after x months. Then, B's money was invested for $(12 - x)$
 $(76000 \times 12)/(57000 \times (12-x))=2/1 \Leftrightarrow 912000=114000(12-x)$

$$114(12 - x) = 912 \Leftrightarrow 12-x=8 \Leftrightarrow x=4$$

Hence, B joined after 4 months.

Ex.7. A, B and C enter into a partnership by investing in the ratio of 3 : 2 : 4. After 1 year, B invests another Rs. 2,70,000 and C, at the end of 2 years, also invests Rs. 2,70,000. At the end of three years, profits are shared in the ratio of 3 : 4 : 5. Find initial investment of each.

Sol. Let the initial investments of A, B and C be Rs. $3x$, Rs. $2x$ and Rs. $4x$ respectively.
 Then,

$$(3x \times 36) : [(2x \times 12) + (2x + 270000) \times 24] : [(4x \times 24) + (4x + 270000) \times 12] = 3:4:5$$

$$108x : (72x + 6480000) : (144x + 3240000) = 3 : 4 : 5$$

$$108x / (72x + 6480000) = 3/4 \Leftrightarrow 432x = 216x + 19440000$$

$$\Leftrightarrow 216x = 19440000$$

$$x=90000$$

Hence, A's initial investment = $3x$ = Rs. 2,70,000;

B's initial investment = $2x$ = Rs. 1,80,000;

C's initial investment = $4x$ = Rs. 3,60,000.