

# Partnership

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QUANTITATIVE APTITUDE

# Partnership

Partnership is based on three points, first is time, second is investment and the third one is profit.

$$\begin{aligned}\text{Profit} &\propto \text{investment} \\ \text{Profit} &\propto \text{time}\end{aligned}$$

So, ratio of profit is directly proportional to the product of investment and time.

## Profit and Capital

$$\begin{aligned}\text{Profit (P)} &\propto \text{Capital (C)} \\ P_1 : P_2 &= C_1 : C_2\end{aligned}$$

**Q. P, Q and R started a business with Rs.10,000, Rs.12,000 and Rs.15,000 respectively for 2 years and they get Rs.55,500 as profit. Find the Q's share in the profit.**

**A.** Ratio of investment of P, Q and R = 10,000 : 12,000 : 15,000 = 10 : 12 : 15

$$\Rightarrow \text{The profit of Q} = \frac{12}{(10 + 12 + 15)} \times 55,500 = \frac{12 \times 55,500}{37} = \text{Rs.18,000}$$

## Common Mistake

The above formula shall be applied only when the **Time Period** is same/constant. The next section explains the situation when Time Periods are different.

## Mix Partnership

When the partners are involved for different Time Periods,

$$P_1 : P_2 = C_1 T_1 : C_2 T_2 ,$$

where, P: Profit, C: Capital and T: Time Period

**Q. P, Q and R entered into the partnership. P contributes Rs. 14,000 for 5 months, Q contributes Rs. 28,000 for 7 months and R contributes Rs. 21,000 for 4 months. If the total profit made is Rs. 12,500, then find the profit of R.**

**A.**  $P_1 : P_2 : P_3 = C_1 T_1 : C_2 T_2 : C_3 T_3$

$$P_1 : P_2 : P_3 = 14,000 \times 5 : 28,000 \times 7 : 21,000 \times 4 = 5 : 14 : 6$$

$$\Rightarrow \text{The profit of R} = \frac{6}{5 + 14 + 6} \times 12,500 = \frac{6 \times 12,500}{25} = \text{Rs. 3000}$$

## Change in Capital

**Q. P, Q and R started a business respectively with Rs.100000, 120000 and 180000 for one year. After 2 months P adds Rs.20000, Q and R respectively withdraws Rs.40000 and Rs.8000. If at the end of 1 year P gets Rs.400 more than R, then find the total profit.**

**A.** Ratio of profit of (P : Q : R) =  $(100000 \times 2) + (120000 \times 10) : (120000 \times 2) + (80000 \times 10) : (180000 \times 2) + (100000 \times 10)$

$$\text{Profit of (P : Q : R)} = 140 : 104 : 136 = 35 : 26 : 34$$

Let the profit of P, Q and R be 35x, 26x and 34x

$$35x - 34x = 400$$

$$x = 400$$

$$\therefore \text{Total profit} = 35x + 26x + 34x = 95x = \text{Rs. 38,000}$$

## Rent Distribution

**Q. P, Q and R rented a meadow. P puts 10 cows for 7 months, Q puts 21 cows for 2 months and R puts 14 cows for 6 months. If the rent of the meadow is Rs.3570, how much must R pay (in rupees) as his share of rent?**

**A.**  $P : Q : R = 10 \times 7 : 21 \times 2 : 14 \times 6$   
 $P : Q : R = 5 : 3 : 6$

$$\text{Share of R} = \frac{6}{5+3+6} \times 3570 = \frac{3 \times 3570}{7} = \text{Rs.1530}$$

## Condition Dependent

**Q. P and Q started a business and the ratio of their investment is 5 : 7. They decided that 70% of the profit will be divided into equal parts and rest of the profit will be divided into the ratio of their investments. If Q got Rs.500 more than P, find the total profit.**

**A.** Let the total profit earned be x,  
According to the question,

$$\frac{2}{12} \times \frac{30x}{100} = 500$$
$$x = \text{Rs.10000}$$