

01

A student took five papers in an examination, where the full marks were the same for each paper. His marks in these papers were in the proportion of 6 : 7 : 8 : 9 : 10. In all papers together, the candidate obtained 60% of the total marks. Find the number of papers in which he got more than 50% marks.

Let the marks scored in 5 subjects be $6x$, $7x$, $8x$, $9x$ and $10x$ (on a scale of 1)

Average score = 60%

$$\Rightarrow \frac{6x+7x+8x+9x+10x}{5} = \frac{60}{100}$$

$$\Rightarrow 8x = 0.6 \Rightarrow x = 0.075$$

So, the marks are 0.45, 0.525, 0.6, 0.675 and 0.75

\therefore Hence, the student got more than 50% marks in 4 papers

02

A contractor engages 54 workers to complete a job in 21 days. After working for 3 days, he found that he would get the work completed in 28 days if he does not increase the number of workers. How many more workers should he engage to get the work done in time ?

After working for '3' days rest of the work will be completed in 28 days by 54 months. But work should be completed in $21 - 3 = 18$ days

It is in inverse proportion

\therefore No. of workers required to complete in 18 days

$$= \frac{28 \times 54}{18} = 84$$

\therefore More workers required = $84 - 54 = 30$

03 Abdul and Ramesh can do a piece of work in 10 and 15 days respectively. They work together for 2 days and then Abdul leaves. How long would Ramesh take to finish the remaining work ?

Part of work done by abdul & Ramesh in 2 days

$$= 2 \left[\frac{1}{10} + \frac{1}{15} \right]$$

$$= 2 \left[\frac{3+2}{30} \right] = 2 + \frac{5}{30} = \frac{1}{3}$$

$$\text{Remaining work} = 1 - \frac{1}{3} = \frac{2}{3}$$

Number of days took by Ramesh to complete to

$$\text{the remaining work} = \frac{\left(\frac{2}{3}\right)}{\frac{1}{15}} = \frac{2}{3} \times 15 = 10 \text{ days}$$

04

The marked price of an article is 32% above its cost price. What is the rate of discount he can offer so that he gains 10% ?

Let CP be Rs. x

$$\therefore \text{MP} = \frac{132}{100}x$$

$$\text{SP} = \frac{110}{100}x = \frac{11x}{10}$$

$$\text{Discount} = \text{MP} - \text{SP} = \frac{33x}{25} - \frac{11x}{10}$$

$$= \frac{66x - 55x}{50} = \frac{11x}{50}$$

$$\text{Discount}\% = \frac{\text{Discount}}{\text{MP}} \times 100$$

$$= \frac{\left(\frac{11x}{50}\right)}{\frac{33x}{25}} \times 100 = \frac{\cancel{11}x}{50^{\cancel{2}}} \times \frac{\cancel{25}}{\cancel{33}x^{\cancel{3}}} \times \cancel{100}^{\cancel{50}}$$

$$= 16\frac{2}{3}\%$$

05

A and B do a piece of work in 10 days, B and C do it in 15 days and C and A do it in 12 days.

- (a) In how many days will A, B and C finish it working together ?
- (b) In how many days will each one of them finish it working alone ?

$$\text{Part of work done by A \& B in one day} = \frac{1}{10}$$

$$\text{Part of work done by B \& C in one day} = \frac{1}{15}$$

$$\text{Part of work done by C \& A in one day} = \frac{1}{12}$$

Part of work done by 2A + 2B + 2C in one day

$$= \frac{1}{10} + \frac{1}{15} + \frac{1}{12} = \frac{6+4+5}{60} = \frac{1}{4}$$

$$\text{Part of work done by (A+B+C) in one day} = \frac{1}{8}$$

∴ A, B & C together finish the work in '8' days

Part of work done by alone A in one day

$$= \frac{1}{5} - \frac{1}{8} = \frac{15-8}{120} = \frac{7}{120}$$

$$\text{'A' alone completes in } \frac{120}{7} = \frac{1}{7} \text{ days}$$

Part of work done by alone 'B' in one day

$$= \frac{1}{8} - \frac{1}{12} = \frac{3-2}{24} = \frac{1}{24}$$

'B' alone complete in 24 days

Part of work done by alone 'C' in one day

$$= \frac{1}{8} - \frac{1}{10} = \frac{5-4}{40} = \frac{1}{40}$$

'C' alone complete the work in 40 days

06

A fraction in reduced form is such that when it is squared and then its numerator is increased by 25% and the denominator is reduced to 80% it results in $\frac{5}{8}$ of the original fraction. Find the product of the numerator and denominator.

$$\frac{x}{y} \rightarrow \frac{x^2}{y^2} \rightarrow \frac{1.25x^2}{0.8y^2} = \frac{25x^2}{16y^2}$$

$$\text{Now since } \frac{25x^2}{16y^2} = \frac{5}{8} \left(\frac{x}{y} \right) \Rightarrow \frac{x}{y} = \frac{2}{5}$$

$$\therefore \text{Product of numerator and denominator} \\ = 2 \times 5 = 10$$