

Unit-1

HCF and LCM - Decimal fractions

1) Find the HCF of 513, 1134 and 1215

$$\begin{array}{r} 1134 \overline{) 1215} \quad (1 \\ \underline{1134} \\ 81 \overline{) 1134} \quad (14 \\ \underline{81} \\ 324 \\ \underline{324} \\ 0 \end{array}$$

HCF of 1134 and 1215 is 81.

So, required HCF = HCF of 513 and 81

$$\begin{array}{r} 81 \overline{) 513} \quad (6 \\ \underline{486} \\ 27 \overline{) 81} \quad (3 \\ \underline{81} \\ 0 \end{array}$$

HCF of given numbers = 27

2) Find the HCF of 108, 288 and 360.

$$\begin{aligned} 108 &= 2^2 \times 3^2, 288 = 2^3 \times 3^2 \text{ and } 360 = 2^3 \times 3^2 \times 5 \\ &= 2^2 \times 3^2 = 36 \end{aligned}$$

3) Reduce $\frac{391}{667}$ to lowest terms.

HCF of 391 and 667 is 23.

on dividing the numerator & denominator by 23, we get

$$\frac{391}{667} = \frac{391 \div 23}{667 \div 23} = \frac{17}{29}$$

4) The HCF of two numbers is 11 and their LCM is 693.

If one of the numbers is 77. Find the other

$$\text{other number} = \frac{11 \times 693}{77} = 99 //$$

5. Find the least number which when divided by 20, 25, 35 and 40 leaves remainders 14, 19, 29 & 39 respectively.

$$\text{Here } (20-14) = 6, (25-19) = 6,$$

$$(35-29) = 6 \text{ and } (40-34) = 6$$

Required Number

$$= (\text{LCM of } 20, 25, 35, 40) - 6$$

$$= 1394$$

6. If $\frac{1}{3.718} = 2689$, then find the value of $\frac{1}{0.003718}$

$$\frac{1}{0.003718} = \frac{10000}{3.718} = \left(10000 \times \frac{1}{3.718} \right) = 10000 \times 2689 = 26890000$$

7. Arrange the fractions $\frac{3}{5}$, $\frac{4}{7}$, $\frac{8}{9}$ and $\frac{9}{11}$ in their descending order.

$$\text{Clearly } \frac{3}{5} = 0.6, \frac{4}{7} = 0.571, \frac{8}{9} = 0.88, \frac{9}{11} = 0.818$$

$$\text{Now } 0.88 > 0.818 > 0.6 > 0.571$$

$$\frac{8}{9} > \frac{9}{11} > \frac{3}{5} > \frac{4}{7}$$

8. Evaluate

i) $31.004 - 17.2386$

$$\begin{array}{r} 31.0040 \\ - 17.2386 \\ \hline 13.7654 \end{array}$$

ii) $13.0000 - 5.1967$

$$\begin{array}{r} 13.0000 \\ - 5.1967 \\ \hline 7.8033 \end{array}$$

9. Express as vulgar fractions

i) $0.\overline{37}$

$$= \frac{37}{99}$$

ii) $0.\overline{053}$

$$= \frac{53}{999}$$

iii) $3.\overline{142857}$

$$= 3 + 0.\overline{142857}$$

$$= 3 + \frac{142857}{999999}$$

$$= 3 + \frac{142857}{999999}$$

$$= 3 \frac{142857}{999999}$$

10 Simplify

$$0.05 \times 0.05 \times 0.05 + 0.04 \times 0.04 \times 0.04$$

$$0.05 \times 0.05 + 0.05 \times 0.04 + 0.04 \times 0.04$$

$$= \frac{a^3 + b^3}{a^2 + ab + b^2} \quad a = 0.05 \quad b = 0.04$$

$$= (a+b) = (0.05 + 0.04) = 0.09.$$

Write - 2

Square roots & Cube roots - percentage - Average -
Ratio and proportion - partnership - profit, Loss.

1) Find the value of $\sqrt{1\frac{9}{16}}$

$$\sqrt{1\frac{9}{16}} = \sqrt{\frac{25}{16}} = \frac{\sqrt{25}}{\sqrt{16}}$$

$$= \frac{5}{4} = 1\frac{1}{4}$$

2) what is the square root of 0.0009?

$$\sqrt{0.0009} = \sqrt{\frac{9}{10000}} = \frac{\sqrt{9}}{\sqrt{10000}} = \frac{3}{100} = 0.03$$

3) what will come in place of question mark

$$i) \sqrt{\frac{32.4}{?}} = 2 \quad ii) 86.49 + \sqrt{5 + (?)^2} = 12.3$$

ii)

Let

$$\sqrt{86.49 + \sqrt{5 + x^2}} = 12.3$$

Then

$$9.3 + \sqrt{5 + x^2} = 12.3 \Rightarrow \sqrt{5 + x^2}$$

$$= 12.3 - 9.3 = 3$$

$$5 + x^2 = 9 \Rightarrow x^2 = 9 - 5 = 4$$

$$x = \sqrt{4} = 2$$

i) Let

$$\sqrt{\frac{32.4}{x}} = 2$$

Then

$$\frac{32.4}{x} = 4 = 4x = 32.4$$

$$x = 8.1$$

4) find the average of all prime numbers b/w 30 and 50.

Ans: 5 prime b/w 30 & 50 are 31, 37, 41, 43, 47

$$\text{Required Average} = \left[\frac{31 + 37 + 41 + 43 + 47}{5} \right]$$

$$= \frac{199}{5}$$

$$= 39.8$$

5) Find the average of first 20 multiples of 7.

$$\text{Required average} = \frac{7(1+2+3+\dots+20)}{20}$$

$$= \frac{7 \times 20 \times 21}{20 \times 2} = \frac{147}{2} = 73.5$$

6) Find the average of first 40 natural numbers.

$$\text{Sum of first } n \text{ natural number} = \frac{n(n+1)}{2}$$

$$\text{So, Sum of 40 number} = \frac{40(41)}{2} = 820$$

$$\text{Required average} = \frac{820}{40} = 20.5$$

7) The average of 11 results is 60. If the average of first six results is 51 that of the last six is 63. Find the sixth results.

$$\begin{aligned}\text{Sixth results} &= (51 \times 6 + 63 \times 6 - 60 \times 11) \\ &= 66.\end{aligned}$$

8) The average weight of 10 old man in a boat is increased by 1.8 kg when the crew, who weighs 53 kg is replaced by a new man. Find the weight of the man.

$$\begin{aligned}\text{Total increase of weight} & \\ &= (1.8 \times 10) \text{ kg} = 18 \text{ kg}\end{aligned}$$

$$\begin{aligned}\text{Weight of the new man} & \\ &= (53 + 18) \text{ kg} = 71 \text{ kg}\end{aligned}$$

9) A batsman makes a score of 87 runs in the 17th inning and then increases his average by 3. Find his average after 17th inning.

Let the average after 17th inning
= x

Then, average after 16th inning

$$= (x - 3)$$

$$16(x - 3) + 87$$

$$17x \text{ or } x = (57 - 48)$$

$$= 39.$$

Unit-3

Time and work - Time and distance.

1) How many minutes does Aditiya take to cover a distance of 400 m. If he is at a speed of 20 km/h?

$$\text{Aditiya's speed} = 20 \text{ km/h}$$

$$= \left(20 \times \frac{5}{18} \right) \text{ m/sec}$$

$$= \frac{50}{9} \text{ m/sec}$$

$$\text{Total Time Taken to cover 400 m} =$$

$$= \left(400 \times \frac{9}{50} \right) \text{ Sec}$$

$$= 72 \text{ sec}$$

$$= 1 \frac{12}{60} \text{ min.}$$

$$= 1 \frac{1}{5} \text{ min.}$$

2) A Cyclist covers a distance of 750 m in 2 min 30 sec. what is the speed in km/hr of the cyclist?

$$\text{Speed} = \frac{750}{150} \text{ m/sec} = 5 \text{ m/sec}$$

$$= \left(5 \times \frac{18}{5} \right) \text{ km/hr}$$

$$= 18 \text{ km/hr.}$$

3) An Aeroplane flies along the four sides of a square at the speeds of 200, 400, 600 and 800 km/hr. Find the average of the plane around the field.

Let each side of the square be x km and let the average speed of the plane around the field be y km/hr. Then.

$$\frac{x}{200} + \frac{x}{400} + \frac{x}{600} + \frac{x}{800} = \frac{4x}{y}$$

$$= \frac{25x}{2400} = y = \frac{2400 \times 4}{25} = 384 \text{ km/hr.}$$

4) I walk a certain distance and ride back taking a total time of 37 minutes. I could walk both way in 55 minutes. How long would it take me to ride both ways?

Let the distance be x km. Then

$$\begin{aligned} & (\text{Time taken to walk } x \text{ km}) + (\text{Time taken to ride } x \text{ km}) \\ & + (\text{Time taken to walk } x \text{ km}) + (\text{Time taken to ride } x \text{ km}) \\ & = 74 \text{ min.} \end{aligned}$$

$$\text{But time taken to walk } 2x \text{ km} = 55 \text{ min}$$

$$\begin{aligned} & \text{Time taken to ride } 2x \text{ km} \\ & = (74 - 55) \text{ min} = 19 \text{ min} \end{aligned}$$

- 5) worker A takes 8 hours to do a job.
worker B takes 10 hrs to do the same.
How long should it take both A and B
working together but independently to do?

Sol

$$A's \ 1 \text{ hr work} = \frac{1}{8}$$

$$B's \ 1 \text{ hr work} = \frac{1}{10}$$

$$(A+B)'s \ 1 \text{ hr work} = \frac{1}{8} + \frac{1}{10} = \frac{9}{40}$$

$$= \frac{40}{9} = 4\frac{4}{9} \text{ days}$$

- 6) A can do a certain job in 12 days. B is
60% more efficient than A. How many days
does B alone take to do the same job?

Sol

Ratio of time taken by A+B = $160:100 = 8:5$

Suppose B alone takes x days to do

Then

$$8:5:12:x \Rightarrow 8x = 5 \times 12$$

$$x = 7\frac{1}{2} \text{ days.}$$

- 7) A and B together can complete a piece of
work in 4 days. If A alone to complete
the same work in 12 days. In how many
days can B alone to do it?

Sol

$$(A+B)'s \ 1 \text{ day's work} = \frac{1}{4}$$

$$A's \ 1 \text{ day work} = \frac{1}{12}$$

$$B's \ 1 \text{ day} = \frac{1}{4} - \frac{1}{12} = \frac{1}{6}$$

$$= 6 \text{ days.}$$

8) A is twice as good as workman as B and together they finish a piece of work in 18 days. In how many days will A alone do it?

sol

A's 1 day's work : B's 1 day's work

2 : 1

$$(A+B)'s \text{ 1 day work} = \frac{1}{18}$$

Divide $\frac{1}{18}$ in the ratio 2:1

$$A's \text{ 1 day's work} = \left(\frac{1}{18} \times \frac{2}{3} \right) = \frac{1}{27}$$

A wants 27 days to do it.

9) A and B undertaken to do a piece of work for Rs 600. A alone can do it in 6 days while B alone can do it in 8 days. With the help of C, they finish it in 3 days. Find the share of each.

$$C's \text{ 1 day work} = \frac{1}{3} - \left(\frac{1}{6} + \frac{1}{8} \right) = \frac{1}{24}$$

A:B:C = Ratio of their 1 day's work

$$= \frac{1}{6} : \frac{1}{8} : \frac{1}{24} = 4 : 3 : 1$$

$$A's \text{ share} = Rs \left[600 \times \frac{4}{8} \right] = 300/-$$

$$B's \text{ share} = Rs \left(600 \times \frac{3}{8} \right) = 225/-$$

$$C's \text{ share} = Rs (600 - 300 - 225) = 75/-$$

Unit-4

Problems on trains - on Numbers - on age

1) Find S.P when

so) 1) C.P = Rs 56.25, Gain = 20%.

$$\begin{aligned} \text{S.P} &= 120\% \text{ of Rs } 56.25 = \text{Rs} \left(\frac{120}{100} \times 56.25 \right) \\ &= \text{Rs } 67.50/- \end{aligned}$$

ii) C.P = Rs 80.40, Loss = 85

$$\text{S.P} = 85\% \text{ of Rs } 80.40$$

$$= \text{Rs} \left(\frac{85}{100} \times 80.40 \right)$$

$$= \text{Rs } 68.34 //$$

2) Find C.P, when

i) S.P = Rs 40.60, Gain = 16%

so)
$$\text{C.P} = \text{Rs} \left(\frac{100}{116} \times 40.60 \right)$$

$$= \text{Rs } 35 //$$

3) Find S.P

S.P = Rs 51.70, Loss = 12%

so)
$$\text{C.P} = \text{Rs} \left(\frac{100}{88} \times 51.70 \right) = \text{Rs } 58.75 //$$

4) If the Cost price is 96% of the selling price then what is the profit percentage?

Sol

$$S.P = Rs 100$$

$$C.P = 96$$

$$Profit = \cancel{Rs} 4.$$

$$Profit = \left(\frac{4}{96} \times 100 \right) \%$$

$$= \frac{25}{6} \%$$

$$Profit = 4.17 \%$$

5) If the Cost price is 96% of the selling price, then what is the profit percentage?

Sol

$$Let \quad S.P = Rs 100$$

Then

$$C.P = Rs 96$$

$$Profit = Rs 4$$

$$= \left(\frac{4}{96} \times 100 \right) \%$$

$$= \frac{25}{6} = 4.17 \%$$

6) A tradesman sold an article at a Loss of 20%. If the Selling Price had been increased by Rs 100, there would have been a gain of 5%. What is the Cost?

$$Let \quad C.P \text{ be } x$$

Then

$$(105\% \text{ of } x) - (80\% \text{ of } x)$$

$$= 100 \text{ or } 25\% \text{ of } x = 100$$

$$\frac{x}{4} = 100 \text{ or } x = 400; \text{ So, } C.P = Rs 400.$$