701. Let the S.P. be Rs. x $\therefore$ C.P. $= \frac{3x}{5}$

His S.P. at 10% more than the S.P. $= \frac{110}{100}x$

$\therefore$ Gain $= \frac{11x}{10} - \frac{3x}{5} = \frac{5x}{10} = \frac{\frac{5x}{10}}{\frac{3x}{5}} \times 100 = \frac{250}{3}$

$\therefore$ Gain $= 83\frac{1}{3}\%$

702. S.P. = Rs.8000 ; Loss = 20%

$\therefore$ C.P. $= \frac{8000 \times 100}{100 - 20} = \frac{8000 \times 100}{80} = 10000$

Now S.P. = 8500

Loss $= \frac{10000 - 8500}{10000} = \frac{1500}{10000}$

Loss% $= \frac{1500}{10000} \times 100 = \mathbf{15\%}$

703.

Men	Hours	Days
12	8	16
x	12	8

$\Rightarrow x = \frac{12}{1} \times \frac{8}{12} \times \frac{16}{8} = \mathbf{16\ men}$

704. Work done by B $= 1 - \frac{5}{6} = \frac{1}{6}$;

$(A + C) : B = \frac{5}{6} : \frac{1}{6} = 5 : 1$

Total share is 6 and the amount is Rs. 600

B's share = Rs. $\left(600 \times \frac{1}{6}\right)$ = **Rs. 100**

705. 50% of x + 50 = x $\Rightarrow x - \frac{50}{100}x = 50$

$\therefore x - \frac{x}{2} = 50$ or $\frac{x}{2} = 50$ (or) x = **100**

706. $\frac{4}{5} \times \frac{2}{7} \times x = \frac{5}{6} \times \frac{20}{100} = \frac{1}{6}$

$x = \frac{1}{6} \times \frac{5}{4} \times \frac{7}{2} = \frac{35}{48}$

707. Let the required number be x.

Then $\frac{60}{100}x = 25.8$ (or) $\frac{25.8 \times 100}{60}$

$= 4.3 \times 10 = \mathbf{43}$

708. Let the number of coins in the bag be "x" of 50 paise, "2x" of 25 paise, "4x" of 20 paise and "8x" of 10 paise.

Thus the total amount would be given as

$= (0.50)x + (0.25)2x + (0.20)4x + (0.10)8x$

= Rs.52

$\therefore 2.6x = 52 \Rightarrow x = 20$

$\therefore$ The bag contains "4x" = 80 coins of 20 paise

709. A : B $= \frac{A}{B} = \frac{3}{4}$; $\frac{B}{C} = \frac{2}{3}$

$\frac{A}{C} = \frac{A}{B} \times \frac{B}{C} = \frac{3}{4} \times \frac{2}{3} = \frac{1}{2}$

A : C = 1 : 2

710. $\frac{10}{5} = 2$, $\frac{10}{25} = 0.4$, $\frac{1}{3} = .33$, $\frac{19}{25} = 0.706$

$\therefore$ Smallest ratio is **1 : 3**

711. $\pi r^2 = 154 \Rightarrow r^2 = 154 \times \frac{7}{22} = 49 = r^2$

$\therefore r = 7$

$\therefore$ Circumference $= 2\pi r = 2 \times \frac{22}{7} \times 7 = \mathbf{44\ cm}$

712. Volume $= \frac{4}{3}\pi r^3$

$\left(\frac{4}{3} \times \frac{22}{7} \times 14 \times 14 \times 14\right)$ cm^3 = 11498.66 cm^3

Surface area $= 4\pi r^2 = 4 \times \frac{22}{7} \times 14 \times 14$

$= \mathbf{2464\ cm^2}$

713. January February March

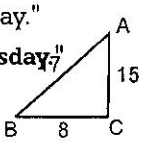
$27 + 28 + 18 = \mathbf{73\ days}$

714. Each day of the week is repeated after 7 days

$\therefore$ After 35 days it will be "Sunday."

$\therefore$ After 32 days it will be "**Thursday.**"

715. AC $= \sqrt{15^2 + 8^2}$



Sec A $= \frac{\text{hypotenuse}}{\text{adj. side}} = \frac{17}{15}$ **cm**

717. Other no. $= \frac{\text{H.C.F.} \times \text{L.C.M.}}{\text{One No.}} = \frac{144 \times 864}{288} = \mathbf{432}$

718. (100 – 70)% of x = 510

$\Rightarrow x = 510 \times \frac{100}{30} = \mathbf{1700}$

719. Out of Rs. 20 (11+9 = 20), the difference is Rs.2. Hence, out of Rs.100, the required difference is Rs.10. **(Observe that we need not calculate the individual shares of two students.)**

720. The average of 21, 26, 29 and 34 is 27.5. Thus, $[(21 + 26 + 29 + 34)] + ?$

$= 8 \times 27.5 \Rightarrow ? =$ **110**

721. **Required ratio** = 200 : 80 = **5 : 2**. Note that when the ratio (of same units) is taken, it is **unitless**. Rs. 4290

Unit of distribution $= \frac{13585}{(5.5+2.75+2.2)} = \frac{13585}{10.45} = 1300$

$\therefore$ Required difference $= 1300\ (5.5 - 2.2)$ **= Rs.4290**

723. The unit Cost Price of sugar $= 11 \div 1.1 =$ Rs.10 per kg. Thus, by selling one kg, the gain is Re.1. Hence, when the total gain is Rs.50, **50 Kg. of sugar must have been sold.**

724. Let B's investment be Rs. "X". Thus we get,

$\frac{\text{A's share of Profit}}{\text{B's share of Profit}} = \frac{3500}{X}$

$\therefore \frac{270}{480} = \frac{X}{(3500+X)}$

$\Rightarrow 270\ (3500 + X) = 480\ X$

$\therefore (210\ X) = 945000 \Rightarrow$ **X = Rs.4500**

725. Required Time $= \frac{1}{\left(\frac{1}{4}+\frac{1}{6}\right)} = \frac{1}{(5 \div 12)} = \frac{12}{5} =$ **2.4 Hours**

726. Let the usual time taken to reach the office by travelling at the usual speed of "X" kmph be "T" hours.

Thus, "Distance = Speed × Time" implies

$5 = XT = (X + 2)\ (T - \frac{1}{12})$

$= XT + 2T - \frac{1}{12}X - \frac{1}{6}$

$\therefore 2T - \frac{1}{12}X = \frac{1}{6} \Rightarrow 24T - X = 2$

$\Rightarrow X = 24T - 2$

$\therefore (24T - 2)T = 5 \Rightarrow 24T^2 - 2T - 5 = 0$

$\therefore 24T^2 - 12T + 10T - 5 = 0$

$\Rightarrow 12T\ (2T - 1) + 5\ (2T - 1) = 0$

$\therefore (2T - 1)\ (12T + 5) = 0$

$\Rightarrow T = (1 \div 2)$ Hours

$\therefore X = 5 \div (1 \div 2) =$ **10 kms.**

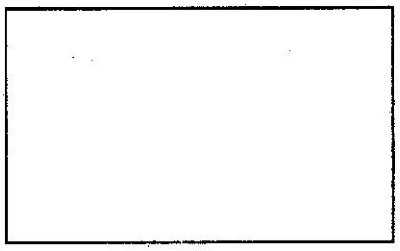
727. Let the two parts be "X" and "280 – X" respectively.

Thus, $0.15\ (X) + 0.24\ (280 - X) = 54$

$\Rightarrow X = 160$. Thus, we have, $(280 - X) = 120$

$\Rightarrow$ Required difference $= 160 - 120 =$ **40**

728. See the figure drawn below:-



$X = 3Y - 2$ and $2(X+Y) = 36$

$\therefore (X+Y) = 18 \Rightarrow 4Y = 20 \Rightarrow$ **Y = 5cm**

$\therefore X = 13$ cm

$\therefore$ Required Area $= 13 \times 5 = 65$ sq.cm.

729. Let the Principal be P; Simple Interest = 360;

$\frac{P \times 10 \times 3}{100} = 360;\ P = \frac{360 \times 100}{10 \times 3}$

= Rs. 1200

730. $P = \frac{A}{\left(1+\frac{r}{100}\right)^n} = \frac{8820}{\left(1+\frac{5}{100}\right)^2}$

$= 8820 \times \frac{20}{21} \times \frac{20}{21} =$ **Rs. 8000**

731. Let one part be Rs. x;

The other part = Rs. 7500 – x;

By data $x \times 2 \times \frac{5}{100} = (7500 - x) \times 6 \times \frac{3}{100}$

$10\ x = (7500 - x) \times 18;\ 10\ x + 18\ x$

$= 7500 \times 18;\ 28\ x = 135000;\ x =$ **Rs. 4821.42**

732. Distance = Speed × Time $= \frac{10}{3} \times 3 = 10$ km; distance = 10 km, new speed = 15 kmph

Time $= \frac{\text{distance}}{\text{speed}} = \frac{10}{15}$ hrs

$= \frac{10}{15} \times 60 =$ **40 minutes.**

733. Distance XY $= \left(80 \times \frac{48}{60}\right) = 64$ km; New speed $= 80 - 8 = 72$ kmph

Time taken $= \frac{D}{S} = \frac{64}{72}$ h $= \frac{64}{72} \times 60 = 53\frac{1}{3}$ m

Extra time taken $= 5\frac{1}{3}$ **hrs.**

734. Speed of train relative to man $= (77 - 5)$ kmph $= 72$ kmph $= 72 \times \frac{5}{18} = 20$ m/sec

$\therefore$ Time taken to pass the man $= \frac{100}{20} =$ **5 sec.**

735. Man's rate in still water $= \frac{1}{2}(15 + 10)$ km/hr $= 12.5$ kmph

Rate of current $= \frac{1}{2}(15 - 10)$ kmph $=$ **2.5 kmph**

736. Let the reservior be filled by first pipe in x hrs; second pipe will fill it in $(x + 10)$ hrs

$\frac{1}{x} + \frac{1}{x+10} = \frac{1}{12} \Rightarrow \frac{x+10+x}{x(x+10)} = \frac{1}{12}$

$\Rightarrow x^2 - 14x - 120 = 0 (=) (x - 20)(x + 6) = 0$

$\Rightarrow x = 20$

$\therefore$ Second pipe takes 30 hrs to fill the reservoir

737. Let the C.P = Rs. x

Difference in SP $= \frac{110x}{100} - \frac{90x}{100} = \frac{20x}{100}$

Given : $\frac{20x}{100} = 25 \quad \therefore x = \frac{2500}{20} =$ **Rs. 125**

738. Work done by A and B in 30 days $= \left(\frac{1}{40} \times 30\right) = \frac{3}{4}$

Remaining work $= 1 - \frac{3}{4} = \frac{1}{4}$

$\frac{1}{4}$ work is done by A in **30 days**

Whole work done by A in $30 \times 4 = 120$ days

739. Let 39% of x = 998.40;

Then $\frac{39}{100} \times x = 998.40$ (or)

$x = \frac{998.40 \times 100}{39} = 2560$

Now 21% of 2560 $= \frac{21}{100} \times 2560 = 537.60$ (or) **538 approx.**

740. Let the two parts be 'x' and '280 – x' respectively.

Thus $0.15(x) + 0.25(280 - x) = 54$

$\Rightarrow x = 160$

Thus we have $(280 - x) = 120$

$\Rightarrow$ Required difference $= 160 - 120 =$ **40**

741. Let the numbers be x and y . Then

$x + y = 16$ and $x^2 + y^2 = 130$

$\therefore 2xy = (x + y)^2 - (x^2 + y^2)$

$= (256 - 130) = 126$

$x - y = \sqrt{x^2 + y^2 - 2xy} = \sqrt{130 - 126} = \sqrt{4} = 2$

Solving $x + y = 16, x - y = 2$, we get $\mathbf{x = 9, y = 7}$

742. Let the two numbers be '9x' and '8x' respectively. Hence, we have $\frac{9x-8}{8x-8} = \frac{8}{7}$

$\Rightarrow \mathbf{x = 8}$.

Thus two numbers are 72 and 64. The required difference is 8.

743.

A	B	C
5	6	
	2	3

A : B : C $\Rightarrow$ 10 : 12 : 18 $\Rightarrow$ 5 : 6 : 9

Let the three numbers be "5x", "6x" and "9x" respectively. $20x = 200 \Rightarrow x = 10$

Difference between largest and smallest number is $9x - 5x = 4x = 40$

744. Milk $= 800 \times \frac{5}{8} = 500$ ml;

water $= 800 - 500 = 300$ ml

Let water to be added be x ml

$\frac{500}{300 + x} = \frac{5}{4} \Rightarrow 2000 = 1500 + 5x$

$\Rightarrow 500 = 5x \Rightarrow x =$ **100**

745. Income from purchase $= 100 \times 12 \times \frac{1}{200} = 6$

Income from selling $= 100 \times 16 \times \frac{1}{200} = 8$

The broker's income $= 6 + 8 + 6 + 8 =$ **Rs. 28**

746. $2\pi r = 396 \Rightarrow 2 \times \frac{22}{7} \times r = 396$;

$\therefore r = \frac{396 \times 7}{2 \times 22} = 63$ m;

Area $= \left(\frac{22}{7} \times 63 \times 63\right)$ cm^2 $=$ **12474 cm^2**

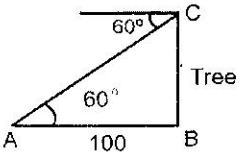
747. Volume $= \left(10 \times \frac{50}{100} \times 2\right)$ cu.m $= 10$ cu.m;

$\therefore$ Weight $= 20 \times 10$ kg $=$ **200 kg.**

748. Go on subtracting 3 and dividing the result by 2 to obtain the next number.

Clearly 46 is wrong.

749. $\tan 60 = \frac{x}{100}$ $\therefore x = 100\sqrt{3} =$ **173.2**



750. Average $\times$ Number $=$ Total

$\therefore$ 27 nos $\times$ 10 years $=$ 270 years ...(1)

28 nos $\times$ 11 years $=$ 308 years ...(2)

$\therefore$ Teacher's age $=$ (2) $-$ (1) $= 308 - 270$

$=$ **38 years.**

751. $\frac{a}{b} = \frac{5}{8} \Rightarrow 8a = 5b \Rightarrow a = \frac{5b}{8}$;

$$\therefore \frac{11}{14} + \frac{b-a}{b+a} = \frac{11}{14} + \frac{b - \frac{5b}{8}}{b + \frac{5b}{8}}$$

$$= \frac{11}{14} + \frac{8b-5b}{8b+5b} = \frac{11}{14} + \frac{3}{13} = \frac{143+42}{182} = \frac{185}{182}$$

753. Investment by A $= 8 \times 2000 = 16000$;
Investment by B $= 6 \times 3000 = 18000$

Now ratio of investments

$= 16000 : 18000 = 8 : 9$

Share of A $=$ Rs. $850 \times \frac{8}{17} =$ **Rs. 400**

754. Area of rectangle $=$ L $\times$ B; $\therefore 5x \times 4x = 500$ sq.m.; or, $2x^2 = 500$ sq.m.

$\therefore x^2 = \frac{500}{20} = 25$; $\therefore x = 5$; $\therefore$ L $= 5 \times 5$ $= 25$ m; B $= 5 \times 4 = 20$ m

$\therefore$ Perimeter $= 2$ (L+B) m $= 2$ (25 + 20) $= 2 \times 45 =$ **90 m**

755. Circumference of wheel $= 2\pi r = 2 \times \frac{22}{7} \times$ 21 cm $= 132$ cm

$\therefore$ No. of revolution $= \frac{92400}{132} =$ **700**

756. Surface area of cuboid $= 2 \times$ (L $\times$ B + B $\times$ H + H $\times$ L)

$= 2\ (3x \times 2x + 2x \times x + x \times 3x)$

$= 2\ (6x^2 + 2x^2 + 3x^2)$

$= 2\ (11x)^2$; $88 = 22x^2$; $x = \sqrt{4} = 2$

$\therefore$ L $= 6$ cm, B $= 4$ cm, H $= 2$ cm

$\therefore$ Volume of cuboid $=$ L $\times$ b $\times$ H $= 6 \times 4 \times 2$ cm^3 $=$ **48 cm^3**

757. 45 km. in 1 hour; 1 km in $\frac{1}{45}$ hour; $\frac{4}{5}$ km in $\frac{4}{5} \times \frac{1}{45}$ hours

$= \frac{4}{5} \times \frac{1}{45} \times 60 \times 60 =$ **64 seconds**

758. $? + \sqrt{196} = 32$; or, $? = 32 - \sqrt{196}$

$= 32 - 14 =$ **18**

759. $? = 3.03 \times 0.03 \times 0.3 =$ **0.02727**

760. $? = \frac{3}{5} + 12\frac{2}{5} + 128\frac{1}{5}$

$$= \frac{3}{5} + \frac{62}{5} + \frac{641}{5} = \frac{3+62+641}{5} = \frac{706}{5} = 141\frac{1}{5}$$

761. $? = 7 + 777 + 7777 + 77777$

$= 784 + 85554 =$ **86338**

762. $? = \frac{20.2 \times 0.002}{10} = \frac{0.0404}{10} =$ **0.00404**

763. Let the number be x;

$\therefore$ According to the question, $\frac{1}{3}x \times \frac{1}{4} = 16$;

$\therefore x = 16 \times 3 \times 4 =$ **192**

764. Cost Price of one scooter $=$ (7800 + 200) $=$ Rs. 8000

$\therefore$ Selling Price $= 8000 + 8000 \times \frac{50}{100}$

$=$ **Rs. 12,000**

765. Distance between Airport and Bus stand $= \frac{40}{60} \times 45 = 30$ km.

Time taken after 10 km/ hour increase in the average speed $= \frac{60}{50} \times 30 = 36$ minutes

$\therefore$ The difference of time $= (45 - 36)$ minutes $=$ **9 minutes**

766. CP $= \frac{100}{25} \times 20 =$ **Rs. 80**

767. Let the number be x

$\therefore$ According to the question, we have

$$\frac{2}{3}x \times \frac{1}{5} \times \frac{3}{4} = 15$$

$$\therefore x = \frac{15 \times 3 \times 5 \times 4}{2 \times 3} = \mathbf{150}$$

768. Let the money lent at 8% be Rs. x, then

$$\frac{x \times 8 \times 1}{100} + \frac{(1550 - x) \times 6 \times 1}{100} = 106$$

or, $2x + 9300 = 10600$; or $x = \mathbf{650}$

769. Let the speed of the second train be x kmph.

Relative speed = (x + 50) kmph

$$= \left[(x+50) \times \frac{5}{18}\right] \text{m/sec.} = \left(\frac{250+5x}{18}\right) \text{m/sec.}$$

Distance covered = (108 + 112) = 220 m

$$\therefore \frac{220}{\left(\frac{250+5x}{18}\right)} = 6 \text{ ; or } 250 + 5x = 660; \text{ or,}$$

$x = \mathbf{82}$ **kmph**

770. Volume of cylinder $= \pi \times 2^2 \times 54 = (216\pi)\ cm^3$

Volume of 1 sphere $= \frac{4}{3}\pi \times \left(\frac{3}{2}\right)^3 = \left(\frac{9\pi}{2}\right) cm^3$

Number of spheres $= \left(216\pi \times \frac{2}{9\pi}\right) = \mathbf{48}$

771. Let cost price be Rs. x

$900 - x = 2(x - 450) \Rightarrow 3x = 1800 \Rightarrow x = 600$

Cost price = Rs. 600; gain required = 25%

$\therefore$ Selling price = Rs. $\left(\frac{125}{100} \times 600\right) =$ **Rs. 750**

772. Internal length = (146 – 6) cm = 140 cm

Internal breadth = (116 – 6) cm = 110 cm

Internal depth = (83 – 3) cm = 80 cm

$\therefore$ Area of inner surface $= [2(l+b) \times h] + lb$

$= [2(140+110) \times 80 + 140 \times 110]$ sq.cm

= 55400 sq.cm

Cost of painting = Rs. $\left(\frac{1}{2} \times \frac{1}{100} \times 55400\right)$

= **Rs. 277**

773. Let the speed of the motorboat in still water be x kmph

Then, speed downstream = (x + 2) kmph

Speed upstream = (x – 2) kmph

$\therefore \frac{6}{x+2} + \frac{6}{x-2} = \frac{33}{60}$; or, $11x^2 - 240x - 40 = 0$

$\therefore 11x^2 - 242x + 2x - 44 = 0$

or, $11x(x - 22) + 2(x - 22) = 0$; or, $x = 22$

$\therefore$ Speed of motorboat in still water = **22 kmph.**

776. $\frac{36 \times 49 \times 125}{25 \times 6 \times 7} \times 100 = 6 \times 7 \times 5 \times 100 = \mathbf{21000}$

777. $12.5 = 50 \times 0.25$ and $12.5 = 2500 \times 0.005$

$\therefore$ L.C.M. = 12.5

Again, $0.25 = 50 \times 0.005$

$0.005 = 1 \times 0.005$; $12.5 = 2500 \times 0.005$

$\therefore$ H.C.F. = **0.005**

778. Required answer

$$= \frac{7+9+9+7+5+3+9}{7} = \frac{49}{7} = \mathbf{7}$$

779. $? - 14.95 - 319.2 = 51.73 - ?$

$\therefore (2 \times ?) = 51.73 + 14.95 + 319.2 = 385.88$

$\therefore ? = 385.88 \div 2 =$ **192.94**

780. $6\frac{8}{11} \div \left(3\frac{4}{7} \times 9\frac{4}{5}\right) \div 5\frac{2}{7} = \frac{1}{?}$

$$\therefore \frac{1}{?} = \frac{74}{11} \div \left(\frac{25}{7} \times \frac{49}{5}\right) \div \frac{37}{7} = \frac{74}{11} \times \frac{1}{35} \times \frac{1}{37}$$

$$\therefore \frac{1}{?} = \frac{2}{55} \Rightarrow ? = \frac{55}{2} = \mathbf{27\frac{1}{2}}$$

781. $\sqrt{\frac{409.948}{2.8}} = ? = \sqrt{146.41} =$ **12.1**

782. $10\frac{6}{7} \div 8\frac{4}{9} \times 2\frac{2}{7} \div 5\frac{1}{4} = 3(?)^3$

$$\therefore 3(?)^3 = \frac{76}{7} \times \frac{9}{76} \times \frac{16}{7} \times \frac{4}{21} = \frac{64 \times 3}{7 \times 7 \times 7}$$

$$\therefore (?)^3 = \frac{4 \times 4 \times 4}{7 \times 7 \times 7} = \left(\frac{4}{7}\right)^3 \Rightarrow ? = \frac{4}{7}$$

783. ? % of 36.8 = 13.248

$\Rightarrow ? = \frac{13.248 \times 100}{36.8} = \mathbf{36}$

784. $1\frac{2}{9} - \frac{3}{7} + ? = 2\frac{3}{4} - 1\frac{2}{9} + \frac{3}{7} = 1 + \frac{241}{252}$

$\therefore ? = 1 + \frac{241}{252} - \frac{11}{9} + \frac{3}{7} = \frac{293}{252} = \mathbf{1\frac{41}{252}}$

785. 3.701 – 0.15 – 1.008 – 0.05 = ? = **2.493**

786. $\frac{4}{5}$ of $\frac{2}{7}$ of ? = $\frac{5}{6}$ of 20% = $\frac{1}{6}$

$\therefore ? = \frac{1}{6} \times \frac{5}{4} \times \frac{7}{2} = \mathbf{\frac{35}{48}}$

787. $81^{0.25} \times 81^{1.25} \times 81^{0.50} = ?$

$= 81^{(0.25+1.25+0.50)}$

$= 81^2 = \mathbf{6561}$

788. $438 \times ? = \frac{705180}{14} = 50370$

$\Rightarrow ? = 50370 \div 438 = \mathbf{115}$

789. $? - 5.6 = 40\%$ of $6.5 + \frac{2}{3}$ of 8.4

or, $? - 5.6 = \frac{40 \times 65}{100 \times 10} + \frac{2}{3} \times \frac{84}{10}$

or, ? – 5.6 = 2.6 + 5.6

or, ? = 8.2 + 5.6 = **13.8**

790. $\sqrt{?} + 48 = 1800 \div 25$

or, $\sqrt{?} + 48 = \frac{1800}{25}$

or, $\sqrt{?} + 48 = 72$

or, $\sqrt{?} = 72 - 48$

or $\sqrt{?} = 24$; $\therefore ? = (24)^2 = \mathbf{576}$

791. 40 of 2400 + ? % of 600 = 50% of 3840

or, $\frac{40 \times 2400}{100} + \frac{?\times 600}{100} = \frac{50 \times 3840}{100}$

or, 960 + ? × 6 = 1920

or, ? × 6 = 1920 – 960

$\therefore ? = \frac{960}{6} = \mathbf{160}$

792. Rs. 330 – Rs. 300 = Rs. 30;

i.e. $\frac{30}{300} \times 100$ = Rs. 10;

$\therefore \frac{300}{10} \times 100 = \mathbf{Rs.\ 3{,}000}$

793. Let the share of P, Q and R be 3x, 5x and 9x respectively.

$\therefore$ According to the question,

9x – 5x = Rs. 1200; 4x = Rs. 1200; x = Rs. 300

$\therefore$ Total share of P and Q = 3x + 5x = 8x

= 8 × Rs. 300 = **Rs. 2400**

794. Let number be x

$\therefore$ According to the question,

$x \times \sqrt{x} = 8$; $x \times (x)^{\frac{1}{2}} = 8$; or, $x^{\frac{3}{2}} = 8 = 2 \times 2 \times 2 = (4)^{\frac{3}{2}}$; $\therefore \mathbf{x = 4}$

795. According to the question, 20% = Rs. 800

$\therefore 25\% = \frac{800}{20} \times 25 = \mathbf{Rs.\ 1000}$

796. We know that speed = $\frac{\text{distance}}{\text{Time}}$

$= \frac{180}{9}$ m/s = 20 m/s = $\frac{20}{1000} \times 60 \times 60$

= **72 kmph.**

797. Required percentage profit

$= \frac{(2072 - 1480)}{1480} \times 100$

$\frac{592}{1480} \times 100 = \mathbf{40\%}$

798. According to the question,

S.I. = Rs. 2000; P = Rs. 8000; T = 4 years;

R = ?

We know that

$S.I. = \frac{PRT}{100}$

or, $2000 = \frac{8000 \times R \times 4}{100}$

$\therefore R = \frac{2000 \times 100}{8000 \times 4} = 6.25 = \mathbf{6\frac{1}{4}\%}$

799. 1 Re coins = 3x; 50 paise coins = 4x; 25 paise coins = 5x

100 × 3x + 4x × 50 + 5x × 25 = 9375

300x + 200x + 125x = 9375 $\Rightarrow$ x = 15

1 Re coins = 3x = **45**

800. $\frac{1}{1 \div \frac{2}{3} \text{ of } \frac{3}{4}} = \frac{1}{1 \div \frac{2}{3} \times \frac{3}{4}} = \frac{1}{1 \div \frac{1}{2}} = \frac{1}{1 \times \frac{2}{1}} = \mathbf{\frac{1}{2}}$

801. 298 – 200 = Rs. 98

No. of additional calls = $\frac{98}{2}$ = 49

Total no. of calls = 150 + 49 = **199**

802. P = Q + 12

Q = R + 12

P + Q = Q + R + 24 or P = R + 24

$\frac{P}{R}=\frac{8}{5}$ $\therefore P=\frac{8R}{5}$

$\frac{8}{5}R = R + 24$; $\frac{8}{5}R - R = 24 \Rightarrow R = \mathbf{40}$

803. Let B = x m, L = 2x m; Area = L × B

$2x \times x = 1800 \Rightarrow x = 30$;

$\therefore$ L = 2 × 30 = **60m**

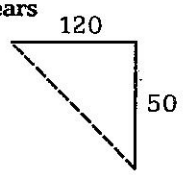
804. Let father's present age be x years

$\because$ Son's present age be 80 – x years

$\frac{x-6}{80-x-6}=\frac{25}{9} \Rightarrow x = \mathbf{56\ years}$

805. Distance covered towards east = D = S × T

= 10 × 12 = 120



Distance covered towards south = 10 × 5 = 50 km

Reqd. distance = $\sqrt{120^2+50^2}$ = **130 km**

806. 30 men can do the remaining work in (50 – 20) i.e. 30 days

$\therefore$ 20 men can do the remaining work in

$=\frac{30\times30}{20}$ = **45 days**

807. $\frac{225+x}{30}=\frac{350+x}{40} \Rightarrow x = 150$ m

Speed = $\frac{225+150}{30}$ m/sec

$=\frac{375}{30}\times\frac{18}{5}$ km/hr = 45

808. x + y = 128, $\frac{x}{y}$ = 3 $\Rightarrow$ x = 3y;

$\therefore$ 3y + y = 128 $\Rightarrow$ y = 32

x = 3 × 32 = 96;

Difference = 96 – 32 = 64

809. $r=\frac{C}{2\pi}=\frac{440}{2}\times\frac{7}{22}=70$

$\therefore$ Area of path = $\pi(R^2 - r^2)$

$=\frac{22}{7}[(70+7)^2 - 70^2]$ = **3234 sq.m.**

810.

Men	Hrs	Earning (in Rs.)
25	8	850
40	6	x

More men more earning

25 : 40

Less hrs less earning :: } 850 : x

8 : 6

$\therefore x=\frac{850\times40\times6}{25\times8} \Rightarrow x = \mathbf{Rs.\ 1020}$

811. Ratio of profits of A, B, C = Ratio of their investments = 5000 : 9000 : 16000 = 5 : 9 : 16

From the total investments (5 + 9 + 16) B's share is 9.

$\therefore$ From the total profit (Rs. 6300) B's share is = $\frac{9}{5+9+16}\times6300$

$\therefore$ B's share = $\frac{9}{5+9+16}\times6300$ = **Rs. 1890**

812. 1 hectare = **10000 sq. m.**

813.

$$\frac{1\frac{1}{7}-\frac{2}{3}+\frac{\frac{2}{5}}{1-\frac{1}{25}}}{1-\frac{1}{7}\text{ of }\left[\frac{1}{3}+\frac{2}{3}\right]}=\frac{1\frac{1}{7}-\frac{2}{3}+\frac{\frac{2}{5}}{\frac{24}{25}}}{1-\frac{1}{7}\text{ of }1}$$

$$=\frac{1\frac{1}{7}-\frac{2}{3}+\frac{2}{5}\times\frac{25}{24}}{1-\frac{1}{7}}=\frac{\frac{8}{7}-\frac{2}{3}+\frac{5}{12}}{\frac{6}{7}}$$

$$=\frac{\frac{96-56+35}{84}}{\frac{6}{7}}=\frac{75}{84}\times\frac{7}{6}=\frac{25}{24}$$

814. For a number to be a multiple of 11,

Sum of digits in the odd places ~ sum of digits in the even places = 0 or a multiple of 11.

In 803642, sum of odd place digits = 8 + 3 + 4 = 15

Sum of even place digits = 0 + 6 + 2 = 8; Difference = 7.

∴ 7 should be added to 803642 to make it a multiple of 11.

815. $\frac{(3\sqrt{5}+\sqrt{3})(\sqrt{5}+\sqrt{3})}{(\sqrt{5}-\sqrt{3})(\sqrt{5}+\sqrt{3})} = \frac{15+3+3\sqrt{15}+\sqrt{15}}{2}$

$= \frac{18+4\sqrt{15}}{2} = 9+2\sqrt{15}$

(The method is to multiply the Numerator and Denominator with the Conjugate)

816. A beats B by 40 metres or 7 seconds. This means that B covers 40 m in 7 seconds

Time taken by B to cover 1 km

$= \frac{1000\times 7}{40} = 175$ seconds

∴ Time taken by A = 175 – 7 = **168 seconds**

817. Let the time be t hrs after the first tap was opened.

In t hours, first pipe fills up t × 1/15 part and so on.

4t + 3(t–1) + 2(t–2) + (t–3) = 60.

∴ t = 7 hours

$t\times\frac{1}{15}+(t-1)\times\frac{1}{20}+(t-2)\times\frac{1}{30}$

$+(t-3)\times\frac{1}{60}=1$

∴ The reservoir is filled up 7 hours after 6.00 a.m. i.e. at 1 p.m.

818. Let the original price be Rs. 100. Increase of 40% raises the price to Rs. 140

Decrease of 20% brings down the price to

$140-\left[140\times\frac{20}{100}\right]=$ Rs.112

∴ New price is 12% more than the original price.

819. $P\left[1-\frac{6\frac{1}{4}}{100}\right]^3 = 21093\frac{3}{4}$;

$= P\times\frac{15}{16}\times\frac{15}{16}\times\frac{15}{16}=21093\frac{3}{4}$

$P=\frac{84375\times16\times16\times16}{4\times15\times15\times15}$ = **Rs. 25600**

820. If the ratio of milk : water = 2 : 1,

quantity of milk in 60 litres $= 60\times\frac{2}{3}=40$ litres

quantity of water in 60 litres = 20 litres

If the ratio of milk and water were to become 1 : 2,

then water to be added = (80 – 20) = **60 litres.**

821. LCM of 27, 35, 25, 21 = 7 × 5 × 3 × 9 × 5 = 4725

7	27, 35, 25, 21
5	27, 5, 25, 3
3	27, 1, 5, 3
	9, 1, 5, 1

∴ Required Number is 4725 – 3 = **4722**

822. Product of two numbers = LCM × HCF = 567×9 = 5103; Let the numbers be x, x + 18

x (x + 18) = 5103; x^2 + 18x – 5103 = 0;

x^2 + 81x – 63x – 5103 = 0

x(x + 81) – 63 (x + 81) = 0;

(x – 63) (x + 81) = 0.

The numbers are 63 and 81

823. $10^3 \simeq 2^{10}$

$\log_2 10^3 \simeq \log_2 2^{10} = 10$.

$3\log_2 10 = 10 \log_2 10 = \frac{10}{3}$

824. n(x) + n(y) – n(x ∩ y) = n(x ∪ y)

20 + n(y) – 5 = 30

n(y) = 30 – 20 + 5 = 15.

∴ y has 15 elements.

825. $x^2+\frac{1}{x^2}=\left(x+\frac{1}{x}\right)^2-2=16-2=14$

$x^4+\frac{1}{x^4}=\left(x^2+\frac{1}{x^2}\right)^2-2=14^2-2$

= 196 – 2 = **194**

826. $\frac{a^2+a-12}{a+4}\times\frac{a+3}{a^2-2a-3}$

$=\frac{(a+4)(a-3)\times(a+3)}{(a+4)(a-3)(a+1)}=\frac{a+3}{a+1}$

827. Let x be the distance covered by walking and y be the distance covered by running.

$x + y = 2$ ....(1)

$\frac{x}{3} + \frac{y}{9} = 3$ ....(2)

(1) × 3 $3x + 3y = 45$ ....(3)

$3x + y = 27$ ....(4)

(3) – (4) $2y = 18$ $y = 9$

$x = 6; y = 9;$

Distance covered by running = **9 km/hr.**

828. If α, β are the roots of $x^2 + x + 2 = 0$

$\alpha + \beta = -1; \alpha\beta = 2;$

$\alpha^2 + \beta^2 = (\alpha + \beta)^2 - 2\alpha\beta = 1 - 4 = -3$

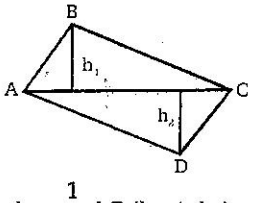
$\alpha^2\beta^2 = 4$

The required equation is $x^2 + 3x + 4 = 0$

829. AC = 220m;

$h_1 = 40.4$ m;

$h_2 = 50.8$ m



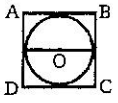
Area of the quadrilateral = $\frac{1}{2}$ AC $(h_1 + h_2)$

$= \frac{1}{2} \times 220[40.4 + 50.8] = 110 \times 91.2$

$= 10032$ **m²**

830. Diameter of the circle = Side of square

$= \sqrt{196} = 14$ cm



$\therefore$ Area $= \frac{22}{7} \times \frac{14}{2} \times \frac{14}{2} =$ **154 cm²**

831. $6a^2 = 726$; $a^2 = \frac{726}{6} = 121$; $a = 11$.

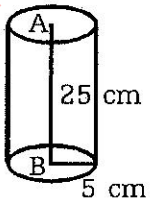
(Surface area of a cube is $6a^2$)

Volume = 11 × 11 × 11 = **1331 cm³**

832. The strip will generate a cylinder as shown in the figure.

Radius and Height of the cylinder are 5 cm and 25 cm.

Volume $= \frac{22}{7} \times (5)^2 \times 25 =$ 1964.29 cm²

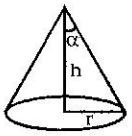


Total surface area $= 2\pi r^2 + 2\pi rh$

$= 2 \times \frac{22}{7} \times 25(5 + 1) =$ **942.86 cm²**

833. $r = h \tan \alpha$

Volume $= \frac{1}{3}\pi r^2 h$

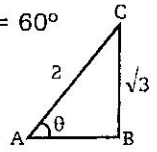


$= \frac{1}{3}\pi\left[h^2 \tan^2 \alpha\right]h = \frac{1}{3}\pi h^3 \tan^2 \alpha$

834. $\sin \theta = \frac{\sqrt{3}}{2}$ which implies $\theta = 60°$

$\tan \theta = \tan 60° = \sqrt{3}$

$\cot \theta = \cot 60° = \frac{1}{\sqrt{3}}$



835. $A + B = 180°$; $A = (180 - B)$; $\sin A = \sin (180 - B) = \sin B$.

$\therefore$ **$\sin^2 A - \sin^2 B = 0$**

836. By Pythagoras' theorem

$AC = \sqrt{AB^2 + BC^2} = \sqrt{64 + 36} = 10$ cm

BM is the median, AM = MC = 5 cm.

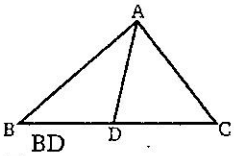
In a right triangle, the mid point of the hypotenuse is the circumcentre

$\therefore$ M is the circumcentre MB=MA=MC=5 cm.

$\therefore$ **BM = 5 cm**

837. AD is the bisector.

By the Internal Bisector theorem, $\frac{AB}{AC} = \frac{BD}{DC}$



As BD = DC, AB = AC.

$\therefore$ **The triangle ABC is isosceles.**

838. $0.00116 \div ? = 0.012 \times 0.58 = 0.00696$

$\therefore ? = 0.00116 \div 0.00696 =$ **1 ÷ 6**

839. $63 + 27 \times 48 \div 45 - 30 \times 1.1 = ?$

$= 63 + 28.8 - 33 =$ **58.8**

840. $345.709 - ? = 344.8892 \Rightarrow ? =$ **0.8198**

841. $13\sqrt{?}$ +21% of 350 = 346.5

$\Rightarrow 13\sqrt{?} = 273$

$\therefore \sqrt{?} = 273 \div 13 = 21 \Rightarrow ?$

$= 21^2 =$ **441**

842. $654.3 \times ? = 3140.64$

$\Rightarrow ? = 3140.64 \div 654.3 = \mathbf{4.8}$

843. Let the ages of "A" and "B" today be "(5 ÷ 6)X" and "X" years respectively. Thus,

we get, $(\frac{5}{6}$ of X – 12) = $\frac{3}{4}$ of (X – 12)

$\Rightarrow \frac{5X-72}{6} = \frac{3X-36}{6}$

$\therefore 20X - 288 = 18X - 216$

$\Rightarrow 2X = 72 \Rightarrow X = 36$. Hence, A's age today = (5 ÷ 6) of 36 = 30 years. Hence, the required age of A twelve years ago = 30 – 12 = **18 years.**

844. Vijay : Sudesh : Kapil = 2100 : 3300 : 4200 = 21 : 33 : 42. Thus, out of the total profit of Rs. 96, Kapil would get Rs. 9 (42 – 33 = 9) more than Sudesh. Hence, out of the total profit of Rs.640, required answer = (640 × 9 ÷ 96) = Rs. 60

845. Required Cost Price = (88.50 ÷ 1.18) = **Rs.75**

846. Let the two positive numbers be "X" and "Y" respectively. Thus, (X + Y) = 32 and (X^2 + Y^2) = 520. Thus, $(X + Y)^2 = 32^2 = 1024$. Thus, $(X^2 + Y^2 + 2XY) = 1024$ $\Rightarrow (2XY) = 1024 - 520 = 504$. $(XY) = 252$. By substituting X = (32 – Y), we get, $(32 - Y)Y = 252 \Rightarrow 32Y - Y^2 = 252$

$\Rightarrow Y^2 - 32Y + 252 = 0$

$\therefore (Y - 18)(Y - 14) = 0 \Rightarrow Y = 18$ or $Y = 14$. Thus, X = 14 or X = 18.

Hence, **the required difference = 4.**

847. Since, after dividing 389 and 518 by the required number, remainders of 2 and 5 are left, the required number must be exactly divisible to (389–2) and (518–5) respectively. Thus, the required number is the H.C.F. **(greatest)** of 387 and 513; which is 9.

848. $\frac{1}{4} \times \frac{1}{6} \times x = 40$

$x = 40 \times 6 \times 4 = \mathbf{960}$.

849. $\frac{2}{3} \times 965 - \frac{2}{3} \times 250$

$= 643.33 - 166.66 = \mathbf{476.67}$

850. $29 \times 9 - 28 \times 8 = 261 - 224 = \mathbf{37}$ **years.**

851. Ratio = 6 : 7

Total age = 28 $\frac{\text{Ram}}{\text{Tinku}} = \frac{6}{7}$

Ram's age = $\frac{6}{13} \times 28 = 12.9 \simeq$ **12 years**

852. Distance = $120 \times \frac{15}{60} = 30$ kms

$\therefore$ It travels **30,000 metres.**

853. Total CP = Rs. 17,000 + Rs. 150 + Rs. 1,200 = Rs. 18,350

SP = Rs. 2,595 × Rs. 9 = Rs. 23,355

Profit percentage = $\frac{23,355 - 18,350}{18,350} \times 100$

$= \mathbf{27.27\%}$

854. No. of days required to complete = $\frac{12 \times 24}{8} = 36$

$\therefore 36 - 24 = \mathbf{12}$ **days.**

855. Area of circle = πr^2

$3540 = \frac{22}{7} \times r^2$

$r^2 = \frac{3540 \times 7}{22} = \sqrt{1126.36}$

$r = 33.56$

Diameter = 2r = **67.12 m**

856. Rise in volume of cylinder = Volume of the sphere

$\pi r^2 h = \frac{4}{3}\pi r^3$

857. Speed of the train = $\frac{74}{5} = 14.8$ m/s

Time taken by the train to pass the platform

$= \frac{74 + 120}{14.8} =$ **13.10 seconds**

858. (A+B)'s work = $\left(\frac{1}{10} + \frac{1}{12}\right) = \frac{11}{60}$

(one day work)

Both will finish the work in $\frac{60}{11}$ days or $5\frac{5}{11}$ days

859. Time = $3\frac{9}{12} = 3\frac{3}{4} = \frac{15}{4}$

Rate = $\frac{1125 \times 100 \times 4}{5000 \times 15} = 6\%$