564. $\frac{x}{4} - \frac{x-3}{6} = 1$

or $\frac{3x-2(x-3)}{12} = 1$ or $3x-2x+6 = 12$ or

$x = 12 - 6 = 6$

565. Given Exp.

$= \frac{3(x+3)(x+1)}{x-1} = \frac{3(x+2+1)(x+2-1)}{x+2-3}$

$= \frac{3(0+1)(0-1)}{0-3} = \frac{3(1)(-1)}{(-3)} = 1$

566. $9x^2 + kxy + 16y^2$

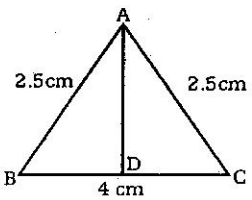
$= (3x)^2 + \frac{2k}{24}(3x)(4y) + (4y)^2$

which will be a perfect square, if

$\frac{k}{24} = 1$ or $\mathbf{k = 24}$

567. Clearly ABC is an isosceles triangle.

Since AD must be right bisector of BC



$\therefore$ BD = DC = ½ (4) = 2 cm

$\therefore$ From right angled ΔADB,

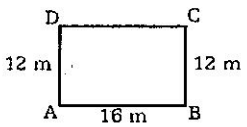
$AB^2 = BD^2 + AD^2$

or $AD^2 = AB^2 - BD^2 = (2.5)^2 - 2^2$

$= 6.25 - 4 = 2.25$

$\therefore AD = \sqrt{2.25} = \sqrt{(1.5)^2} = \mathbf{1.5\ cm}$

568.



Here AB = 16 m

AD = BC = 12 m

$\therefore$ From right angled ΔABC,

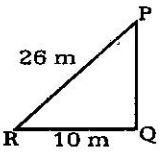
$AC^2 = AB^2 + BC^2$

$= 16^2 + 12^2$

$= 256 + 144 = 400$

$\therefore AC = \sqrt{400} = \sqrt{20^2} = \mathbf{20\ m}$

569



Let RP = 26 m be the ladder and RQ = 10 m

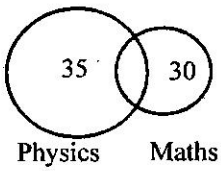
From right angled ΔPQR

$PQ^2 = PR^2 - RQ^2$

$= 26^2 - 10^2 = 676 - 100 = 576$

$\therefore PQ = \sqrt{576} = \sqrt{24^2} = \mathbf{24\ m}$

570.



Total number of students = 50

Number of students who do not like any of Physics and Mathematics = 3

$\therefore$ Number of students who take at least one of the subjects,

$n(P \cup M) = 50 - 3 = 47$

Also, n(P) = 35, n(M) = 30

Using the relation,

$n(P \cup M) = n(P) + n(M) - n(P \cap M)$

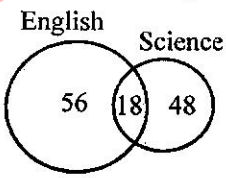
or $47 = 35 + 30 - n(P \cap M)$

or $n(P \cup M) = 65 - 47 = 18$

Hence, number of students who like only Physics

$= n(P) - n(P \cap M) = 35 - 18 = \mathbf{17}$

571.



Given that n(E) = 56; n(S) = 48; $n(E \cap S) = 18$

Using the relation,

$n(E \cup S) = n(E \cup S) = n(E) + n(S) - n(E \cap S)$

$= 56 + 48 - 18 = 86$

Hence, percentage of successful candidates

$= 100 - 86 = \mathbf{14\%}$

572. Average of 6 numbers = 8

Total of 6 numbers = $6 \times 8 = 48$

If the required number is x, then $\frac{48+x}{6+1} = 9$

or $48 + x = 63$ or $x = 63 - 48 = \mathbf{15}$

573. Suppose the number = 100

∴ Number, when increased by 20 % = 120

∴ This number becomes when reduced 20 %

$= \frac{80}{100} \times 120 = 96$

Hence change in number = 100 – 96 = 4 out of 100 = **4%**

574. Total of 60 results = $60 \times 40 = 2400$

Total of 40 results = $40 \times 60 = 2400$

Total of 100 results = 4800

∴ Average of 100 results = $\frac{4800}{100} = \mathbf{48}$

575. The time taken by 5 men to cane 5 chairs

= 5 hours

If one man has to cane all the 5, it is

$5 \times 5 = 25$ hours

If the same man has to cane one chair it is

$= \frac{25}{5} = \mathbf{5\ hours.}$

576. The sum of remaining two numbers is equal to 5 times 6 – 3 times 4 = 30 – 12 = 18

∴ Average = $18 \div 2 = \mathbf{9}$

577. L.C.M of 3, 6 and 7 is 42. Multiply each ratio by 42, we get 14 : 7 : 6

∴ First part is $= \frac{14}{14+7+6} \times 81$

$= \frac{14}{27} \times 81 = \mathbf{42}$

578. Let the sum be Rs. 100/-; it becomes 200 in 10 years. It means, Rs.100/- is interest earned on Rs. 100/- in 10 years. Hence the rate percent per annum = $\frac{100}{10} = \mathbf{10\%}$.

579. 0.15% means $\frac{0.15}{100} = \frac{15}{10000} = \mathbf{0.0015}$

580. $\frac{10 \times 60}{100} + \frac{100 \times 60}{100} = 6 + 60 = \mathbf{66}$

581. BODMAS rule can be applied here.

$5 \div 15 \times 8 = \frac{5}{15} \times 8 = \frac{40}{15}$

582. $\frac{4}{\sqrt{0.000625}} = \frac{4}{\sqrt{\frac{625}{1000000}}} = \frac{4}{\frac{25}{1000}}$

$= 4 \times \frac{1000}{25} = \frac{4000}{25} = \mathbf{160.}$

583. Let the principal be Rs. P and the rate of interest be R% per annum. Then S.I = Rs. P

S. I. $= \frac{P \times R \times 12}{100} = 12R = 100$

$R = \frac{100}{12} = \mathbf{8\frac{1}{3}\%}$

584. $\frac{\text{Selling Price} - \text{Cost Price}}{\text{Cost Price}} \times 100 = \%\ \text{Gain}$

$\frac{15-10}{10} \times 100 = \mathbf{50\%}$

585. An amount of Rs. P becomes 2P in 20 years.

∴ Rate of interest $= \frac{P \times 100}{P \times 20} = \mathbf{5\%}$

586. $\frac{4}{11}$ x = Rs. 80

$x = \left(\frac{11 \times 80}{4}\right) = \frac{880}{4} = \mathbf{Rs.\ 220}$

587. B = 2A = 3C B is twice that of A.

∴ Rs. 330 × 2 = Rs. 660

A = Rs. 330; B = Rs. 660

B is thrice that of C

∴ C's share is $\frac{660}{3}$ = Rs. 200

A + B + C = 330 + 660 + 220 = **Rs. 1210**

588. We have $100 = 2 \times 2 \times 5 \times 5$

Thus has 4 factors, each of which is prime.

589. By applying BODMAS Rule

$\frac{1}{2} \div \frac{1}{2} \times \frac{1}{2} + \frac{1}{2}$

$1 \times \frac{1}{2} + \frac{1}{2} = \frac{1}{2} + \frac{1}{2} = \mathbf{1}$

590. Compound interest $= P\left[\left(1+\frac{r}{100}\right)^n - 1\right]$

$$C.I. = 3000\left[\left(1+\frac{10}{100}\right)^3 - 1\right]$$

$$= 3000\left[\left(\frac{11}{10}\right)^3 - 1\right]$$

$$= 3000 \times \left[\frac{1331}{1000} - 1\right] = 3000 \times \frac{331}{1000}$$

$$= \textbf{Rs. 993}$$

591. Simple interest = Rs. 1200 – 800 = 400

$$\therefore \text{Rs. } 400 = \frac{PTR}{100} = \frac{800 \times 10 \times x}{100}$$

$$400 = 80x$$

$$\therefore x = \frac{400}{80} = \textbf{5\%}$$

592. 15 men can do a job in 16 days.

1 man can do it in $16 \times 15 = 240$ days.

12 men can do it in $\frac{240}{12} = \textbf{20 days.}$

593. If A, B and C work together, the job will be finished in

$$\frac{1}{7}+\frac{1}{14}+\frac{1}{28} \text{ days} = \frac{4+2+1}{28} = \frac{7}{28}$$

$$= \frac{1}{4} = \textbf{4 days}$$

594. Simple interest $= \frac{PTR}{100}$

P = Rs. 600

$$\therefore \text{S.I.} = \frac{600 \times T \times 5}{100} = 30\,T$$

$$T = \frac{600}{30} \quad \therefore \textbf{T = 20 years.}$$

595. The product of means is equal to product of extremes.

$$\therefore 6 \times 32 = 24 \times x$$

$$192 = 24x$$

$$\therefore x = \frac{192}{24} = \textbf{8}$$

596. To cross the bridge, the train has to run 500m. i.e. 300 + 200 = 500 m; 25 metres in a second.

$$\therefore \frac{25}{1} = \frac{500}{?}$$

$$\frac{500}{25} = \textbf{20 seconds}$$

597. Total age of 40 students

in Class I $= 40 \times 10 = 400$

Class II $= 40 \times 8 = 320$

$= 720$

Average of all students $= \frac{720}{80} = \textbf{9 years}$

598. Selling price $= \frac{100 - \text{Loss\%}}{100 \times \text{Cost Price}}$

$= 100 - 20$ times $\frac{70}{100}$

$$= \frac{80 \times 70}{100} = \textbf{Rs. 56}$$

599. $5\frac{4}{9} + 35\% \text{ of } 25 + 9\frac{4}{5} = ?$

$$= 14 + \frac{56}{45} + 8\frac{3}{4}$$

$$? = 22 + 1 + \frac{11}{45} + \frac{3}{4} = 23 + \frac{179}{180} = 23\frac{179}{180}$$

600. $\sqrt{?} + \frac{1}{3} = \frac{1}{2} \Rightarrow \sqrt{?} = \frac{1}{2} - \frac{1}{3} = \frac{1}{6} \Rightarrow ? = \textbf{\frac{1}{36}}$

601. $(3.48 \times 2.4 + 1.05 \times 0.03) \div ?$

$= 0.1035 = 8.3835 \div ?$

$\therefore ? = 8.3835 \div 0.1035 = \textbf{81}$

602. ?% of 268 – ?% of 143 = 56.25

$\therefore$?% of (268 – 143) = 56.25

$$\Rightarrow ? = \frac{56.25 \times 100}{125} = \textbf{45}$$

603. 1.0437 – 0.9536 + 0.0083 – 0.1379 + ? = 0.0048 $\Rightarrow$? = **0.0443**

604.

2	*	6	5	8
–1	5	8	$	*
	1	1		
1	2	$	*	0

Thus, **(i)** $8 - * = 0 \Rightarrow * = 8$ and

(ii) $15 - \$ = 8 \Rightarrow \$ = 7$

605. $14\frac{2}{3}-8\frac{1}{4}+6\frac{2}{5}-9\frac{3}{4}=?$

Separating the integral and the fractional parts, we get

$$? = (14 - 8 + 6 - 9) + \left(\frac{2}{3}-\frac{1}{4}+\frac{2}{5}-\frac{3}{4}\right)$$

$$= 3 + \frac{40-15+24-45}{60}$$

$$\therefore ? = 3+\frac{4}{60} = 3+\frac{1}{15} = \mathbf{3\frac{1}{15}}$$

606. $3000 \div 15 \times 114 - 3200 = ?$

$= 200 \times 114 - 3200 = \mathbf{19600}$

607. $831296 - 92385 + 112354 - 469302 = ?$

$= \mathbf{381963}$

608. $219.31 - 65.293 + 54.78 - 1.572 + 27.4 = ?$

$= \mathbf{234.625}$

609. Cross Multiply: $4 \times x = 24 \times 5$;

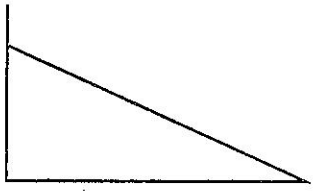
$$x = \frac{24\times5}{4} = \mathbf{30}$$

614. The ratio of value $= 10 \times 7 : 20 \times 4 : 25 \times 3$
$= 70 : 80 : 75 = 14 : 16 : 15$

Now the value of 25P $= 90 \times \frac{15}{45} = 2 \times 15$
$= 30$ rupees.

$\therefore$ No.of 25 P. coins $= 30 \times 4 = \mathbf{120}$.

616. $(21-x)^2 = x^2 + 12^2$



$441 + x^2 - 42x = x^2 + 144$

$441 - 144 = 42x$

$297 = 42x$

$$\therefore x = \frac{297}{42} = \mathbf{7.07\ m}$$

617. $\frac{9}{16}x = \frac{x}{2}+51 \Rightarrow \frac{9x}{16}-\frac{x}{2}=51 \Rightarrow \frac{9x-8x}{16}=51$

$x = 51 \times 16 = \mathbf{816}$

618. $2\pi R = 66;\ 2\pi r = 64$

$$R = \frac{66\times7}{2\times22} = 105;\ r = \frac{44\times7}{2\times22} = 7$$

$\pi R^2 - \pi r^2;\ \pi (R^2 - r^2)$

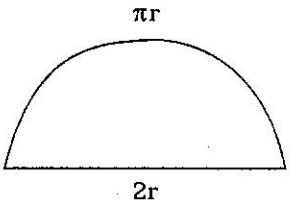
$= \pi (R + r)(R - r)$

$$= \frac{22}{7}(10.5 + 7)(10.5 - 7)$$

$$= \frac{22}{7}(17.5)(3.5) = \mathbf{192.5\ sq.m.}$$

619. $2\pi r = 2\times\frac{22}{7}\times\frac{126}{11\times2} = 36$

$\pi r + 2r = 36$



$$r\left(\frac{22}{7}+2\right) = 36 \text{ cm}$$

$$r\left(\frac{36}{7}\right) = 36 \quad \mathbf{r = 7\ cm}$$

620. $\frac{(3\times40)-(2\times30)}{3+2} = \frac{120-60}{5} = \frac{60}{5} = \mathbf{12\%}$

Note: The actual cost of articles make no difference to the overall percentage.

621. Write like this

Girls	Total	Boys
50	25	6¼

Ratio of Girls : Boys $= (25 - 6¼) : (50 - 25)$
$= 18¾ : 25 = 75 : 100 = 3 : 4$

That is **Girls 120. Boys 160.**

General Note: Suitable changes are to be made in percentages according to the data given. *Example:* 75% failed means 25% passed, 3/5 passed means 2/5 failed, and so on.

622. $\sqrt{12321} = 111$ since there is a pattern like this

$121 = 11^2$

$12321 = 111^2 \therefore \sqrt{12321} = 111$

$1234321 = 1111^2$

$123454321 = 11111^2$

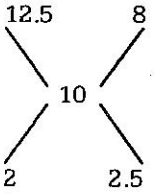
624. $\frac{(x+6)6}{13} - 7 = 5$

$6x + 36 = 12 \times 13$

$6x = 156 - 36 = 120$

$\therefore$ **x = 20.**

625. Cost of the mixture Rs.10/-



4 : 5

626. Let the value of wealth be `x'

Wife's share $= \frac{1}{2}x$

Balance $= \frac{1}{2}\left(\text{i.e. } 1 - \frac{1}{2}\right)$

Son's share $= \frac{1}{2} \times \frac{4}{5} = \frac{4}{10}$

Balance $= \frac{1}{2} - \frac{4}{10} = \frac{5-4}{10} = \frac{1}{10}$

Daughter's share $= \frac{2}{3} \times \frac{1}{10} = \frac{2}{30}$

Balance $= \frac{1}{10} - \frac{2}{30}$

$= \frac{3-2}{30} = \frac{1}{30}$

Balance $\frac{1}{30}$ is for endowment which received Rs. 1000

$\therefore$ Total wealth $= \frac{1000}{1} \times 30 =$ **Rs. 30000**

627. Balances to be 30%, 40%, 50% or 3 : 4 : 5

Actual Ratio 1 : 2 : 3

To be Ratio 3 : 4 : 5

Write in 2 pairs as shown and cross multiply.

A	B	B	C	
1	2	2	3	start from left top
3	4	4	5	

$(1 \times 4):(2 \times 3)(2 \times 5): (3 \times 4)$

$= 4 : 6 \quad 10 : 12$

or 2 : 3 or 5 : 6

Make B common. So, ratio is 10 : 15 : 18

Salary of A $= \frac{1720}{43} =$ **Rs. 400**

Salary of B **= Rs. 600**

Salary of C **= Rs. 720**

628. When consecutive odd numbers are taken it is always the middle number, that is Average. In this case it is 5. In fact, when any odd consecutive numbers are taken it is always the middle number that is average.

Example: 8, 9, 10, 11, 12, 13, 14 - average is 11

or 10, 12, 14, 16, 18 - average 14

It will be seen also that $\frac{8+14}{2} = 11$ & $\frac{18+10}{2} = 14$

629. Teacher's age is (30 + 19) = **49 years.**

630. The increase of $24 \times 10 = 240$ Rs. is spread over all the 24 members at Rs. 10 per person.

New average 800 + 10 = **Rs. 810**

631. The value $\sqrt{65^2 - 16^2} = 63$

$\therefore \sqrt{65^2 - 16^2} = \sqrt{(65+16)(65-16)}$

$= \sqrt{(81)(49)} = \sqrt{81}\sqrt{49} = 9 \times 7 =$ **63**

634. Average speed of total journey = H.M. of 20 km/hr and 30 km/hr

$= \frac{2 \times 20 \times 30}{20+30} = \frac{1200}{50} =$ **24 km/hr.**

635. Given that $\frac{A}{\frac{1}{2}} = \frac{B}{\frac{1}{3}} = \frac{C}{\frac{1}{4}}$

or $2A = 3B = 4C$

or $\frac{2A}{12} = \frac{3B}{12} = \frac{4C}{12}$

or $\frac{A}{6} = \frac{B}{4} = \frac{C}{3}$

Sum of ratios = 6+4+3=13. Suppose total amount is Rs.x

By hypothesis, $\frac{6}{13} \times x - \frac{4}{13} \times x = 400$

$\frac{2}{13}x = 400$

$\therefore x = \frac{400 \times 13}{2} =$ **Rs. 2600**

636. $\left(\sqrt{3}-\frac{1}{\sqrt{3}}\right)^2$

$= \left(\sqrt{3}\right)^2 + \frac{1}{\left(\sqrt{3}\right)^2} - 2\sqrt{3}.\frac{1}{\sqrt{3}}$

$= 3 + \frac{1}{3} - 2 = 1 + \frac{1}{3} = \frac{4}{3}$

637. If r cm be the radius of the circle, then by hypothesis,

$\pi r^2 = 616$ or $r^2 = \frac{616}{\pi} = \frac{616\times 7}{22} = 196 = 14^2$

$\therefore$ **r = 14 cm**

638. Using the formula, $\frac{C}{5} = \frac{F-32}{9}$

When C = 35,

$\frac{35}{5} = \frac{F-32}{9}$ or $7 = \frac{F-32}{9}$ or $F - 32 = 63$

$\therefore F = 63 + 32 =$ **95°F**

639. Average of 6 numbers = 8

$\therefore$ Total of 6 numbers = 6 × 8 = 48. If the required number is x, then

$\frac{48+x}{6+1} = 9$ or $48 + x = 63$ or $x = 63 - 48 =$ **15**

640. $\frac{(7.59)^2 - (5.23)^2}{3 - 0.64} = \frac{(7.59+5.23)(7.59-5.23)}{2.36}$

$= \frac{12.82\times 2.36}{2.36} =$ **12.82**

641. $? = \sqrt{\frac{0.361}{0.00169}} \Rightarrow \sqrt{\frac{361}{1.69}} = \sqrt{\frac{36100}{169}} = \frac{190}{13}$

642. $\therefore$ LCM = 2 × 5 × 3 × 7 × 4 = 840

Now 840 × 1 + 3 = 843 is not exactly divisible by 9, while 840 × 2 + 3 = 1683.

Again now 1683 ÷ 9 = 187

$\therefore$ The required least number = **1683**

643. The required no. of days = $\frac{16\times 18}{36}$ = **8 days**

644. Choice a gives $6^2 = 36$. Choice b gives $4^4 = 256$. Choice c is $8^2 = 64$.

Choice d is 2+4+4=10. Choice e is $4^3 = 64$.

Hence (b) is correct.

645. $\frac{1}{2}\times\frac{x}{2} = \frac{x}{4}$

646. $\frac{0.7\times 0.7\times 0.7 - 0.2\times 0.2\times 0.2}{0.7\times 0.7 + 0.2\times 0.2 + 0.2\times 0.7}$ = Crossing the Numerator and Denominator and using the formula

$\frac{a^3 - b^3}{a^2 + b^2 + ab} = a - b = 0.7 - 0.2 =$ **0.5**

647. The difference between Rs. 3,250 and Rs. 2,800 is Rs. 450 for 3 years

$\therefore$ For one year = $\frac{450}{3} = 150$

$\therefore$ The original principal must be Rs. 2,800 – (150×2) = Rs.2,500

The rate of interest is

2500 150

100 $\frac{100\times 150}{2500} =$ **6**

$\therefore$ 6% is the rate of interest.

648. $\frac{1}{14\frac{2}{3}} + \frac{1}{19\frac{1}{4}} + \frac{1}{13\frac{3}{4}} = \frac{3}{44} + \frac{4}{77} + \frac{4}{55}$

$= \frac{105+80+112}{1540} = \frac{297}{1540}$

Now $\frac{11}{28} - \frac{297}{1540} = \frac{605-297}{1540} = \frac{308}{1540} = \frac{1}{5}$

$\therefore$ **The missing denominator is 5.**

649. $a^2 = 225$ $\therefore a = 15$ $\therefore 4a = 60$

650. Lowest C.P is Rs. 200

Lowest S.P is Rs. 300 $\Rightarrow$ Profit = Rs. 100

Highest C.P is Rs. 350

Highest S.P is Rs. 425 $\Rightarrow$ Profit = Rs. 75

$\therefore$ Maximum profit = Rs. 100

Hence, maximum profit on 16 such articles = Rs. (16×100) = **Rs. 1600**

651. By data : $A = P\left(1+\frac{nr}{100}\right)$

$2442 = \left(1+\frac{4\times 12}{100}\right)$

$\Rightarrow P = \frac{2,442\times 100}{148} =$ **Rs.1,650**

652. By data : $2P = P\left(1+\frac{r}{100}\right)^5$

$2 = \left(1+\frac{r}{100}\right)^5 \Rightarrow 2^3 = \left(1+\frac{r}{100}\right)^{15}$ (by cubing)

$\Rightarrow 8 = \left(1+\frac{r}{100}\right)^{15}$

$\Rightarrow 8P = P\left(1+\frac{r}{100}\right)^{15}$

∴ In 15 years, the amount will become 8 times of itself.

654. Speed $= \frac{\text{Distance}}{\text{Time}}$

$\therefore$ Speed $= \frac{100}{8} \times \frac{18}{5}$ km / hr = **45 km/hr**

655. x men 8 days

x+4 men 6 days

$\therefore \frac{x}{x+4} = \frac{6}{8} \Rightarrow 8x = 6x + 24$

$\Rightarrow$ **x = 12**

656. Quantity of water added $= \frac{40(20-10)}{(100-20)}$

$= \frac{400}{80}$ = **5 litres**

657. Let the S.P be Rs. x

$\therefore x + x \times \frac{10}{100} = 616$

$\therefore x = 560$

$\therefore$ C.P $= 560 \times \frac{100}{112}$ = **Rs. 500**

658. No. of boys present $= \frac{2}{5} - \frac{1}{4}\left(\frac{2}{5}\right) = \frac{3}{10}$

No. of girls present $= \frac{3}{5} - \frac{2}{9}\left(\frac{3}{5}\right) = \frac{7}{15}$

$\therefore$ No. of students present $= \frac{3}{10} + \frac{7}{15} = \frac{23}{30}$

659. Let the original price be Rs.100. Hence, the new price would be Rs.125 (100 + 25% of 100). Thus,

?% of 125 = 100 $\Rightarrow ? = \frac{100 \times 100}{25}$ = **80**

660. Let the three numbers be X,Y and Z. Thus, we get, X : Y = 2 : 3 and Y : Z = 5 : 8 $\Rightarrow$ X : Y :Z = 10 : 15 : 24.

Thus, since (10 + 15 + 24) = 49, the middle number would be 15. [Observe that, if the sum of the numbers would have been 98 (49 × 2), the middle number would have been 30 (15 × 2)]

661. Let the ages of the father and his son today be "2X" and "X" years respectively. Thus, we get, (2X + 10) = (7 ÷ 4) of (X + 10) $\Rightarrow$ 8X + 40 = 7X + 70

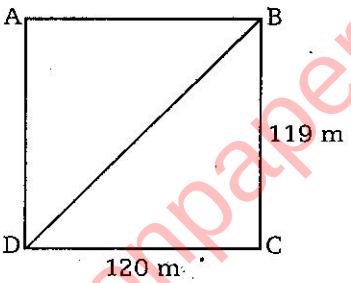
$\therefore$ X = 30 $\Rightarrow$ 2X = **60 years**

662. We have, 1C + 3T = 306 and 8C + 2T = 358. Thus, we get 8C + 24T = 306 × 8 = 2448 $\Rightarrow$ 22T = (2448 − 358) = 2090. Thus we get, T = Rs.95 $\Rightarrow$ C = **Rs. 21.**

663. Required Time $= \frac{1}{\frac{1}{20} - \frac{1}{30}}$

$= \frac{1}{(1 \div 60)} = 60$ hours

664. See the figure drwa below :-



l $(BD)^2 = 120^2 + 119^2 = 14400 + 14161$

$= 28561$

$\therefore$ l(BD) $= \sqrt{28561}$ = **169 m**

Thus, travelling at the rate of 1m/sec, it would take 169 seconds for the man to travel across the diagonally opposite corners (B to D), Hence the answer is 2 minutes 49 seconds.

665. S.I. $= \frac{P \times R \times T}{100}$

$\Rightarrow 15500 - 12500 = \frac{12500 \times R \times 4}{100}$

$\Rightarrow$ **R = 6% p.a.**

666. If "a", "b" and "c" are the three sides of a triangle, we can calculate its area directly as

Area $= \sqrt{s(s-a)(s-b)(s-c)}$ where,

$s = \frac{a+b+c}{2}$ (Semi-perimeter)

$\therefore s = (3 + 4 + 5) \div 2 = 6$ cms

$\therefore$ Area $= \sqrt{6\times(6-3)\times(6-4)\times(6-5)}$

$= \sqrt{6\times3\times2\times1} = \sqrt{36} = 6$ cm².

667. Let the two numbers be "X" and "Y". Thus, we get, (X+Y) : (X–Y):: 9 : 7

$\therefore \frac{(X+Y)}{(X-Y)} = \frac{9}{7} \Rightarrow \frac{(X+Y)+(X-Y)}{(X+Y)-(X-Y)}$

$= \frac{9+7}{9-7} = \frac{16}{2} = \frac{8}{1} = \frac{2X}{2Y} = \frac{X}{Y}$

$\therefore \frac{X}{Y} = \frac{8}{1}$

The larger number would be 8, given that the smaller number is 1.

668. Let the speed of the boat be "X" kmph while that of the current be "Y' kmph.

Thus, we have, Speed = Distance ÷ Time

$\therefore$ (X+Y) = 60 ÷ 5 = 12 kmph

and (X – Y) = 60 ÷ 6 = 10 kmph

$\therefore$ 2X = 22 kmph $\Rightarrow$ X = 11 kmph

$\therefore$ **Y = 1 kmph.**

669. $\left[1+\frac{1}{1\times2}+\frac{1}{1\times2\times4}+\frac{1}{1\times2\times4\times8}+\frac{1}{1\times2\times4\times8\times16}\right]$

$= \frac{2\times4\times8\times16+4\times8\times16+8\times16+16+1}{2\times4\times8\times16}$

$= \frac{1024+512+128+16+1}{1024} = \frac{1681}{1024} = 1.6416$

670. $0.\overline{3467}+0.\overline{1333} = \frac{3467-34}{9900}+\frac{1333-13}{9900}$

$= \frac{3433}{9900}+\frac{1320}{9900} = \frac{3433+1320}{9900} = \frac{4753}{9900}$

$= 0.\overline{4801}$

671. Let the length of a rectangular plot is x m. Then its breadth = 40% of x = 0.4 x m. By hypothesis, $x \times 0.4x = 250$ or $0.4x^2 = 250$

or $x^2 = \frac{250}{0.4} = 625$ $\therefore$ x = 25 m

$\therefore$ Perimeter of the rectangular plot

$= 2(l+b) = 2(x+0.4\ x) = 2(25+0.4\times25) = 2(25+10) = 2\times35 = 70$ m

672. L.C.M. of 4, 5 and 6 = 60

Numbers between 200 and 600 which are divisible by 60 = 60×4, 60 × 5, 60 × 6, 60 × 7, 60 × 8, 60 × 9 = 240, 300, 360, 420, 480, 540.

673. Total of the numbers which are exclusively in set A = 2 + 9 + 17 + 21 + 41 = **60**

674. Reqd. Difference = (42 + 7 + 39 + 5 + 19 + 33 + 53 + 29 + 41) – (19 + 33 + 53 + 29 + 41) = 42 + 7 + 39 + 5 = **93**

675. $\sqrt[3]{\frac{1}{8}\times\frac{125}{64}} = \left(\frac{1}{2^3}\times\frac{5^3}{4^3}\right)^{\frac{1}{3}} = \frac{1}{2}\times\frac{5}{4} = \frac{5}{8}$

676. $\frac{8}{?} = \frac{?}{12\frac{1}{2}} = \frac{?}{\frac{25}{2}} = \frac{2\times?}{25}$

$\therefore (?)^2 = \frac{8\times25}{4} = 100 = 10^2$ $\therefore$? = 10

677. Suppose sum = Rs. P, Rate = r%
Time (T) = 5 years, Amount = Rs. 2P

$\therefore 2P = P\left(1+\frac{r}{100}\right)^5$ or $2 = \left(1+\frac{r}{100}\right)^5$

$\therefore 1+\frac{r}{100} = 2^{\frac{1}{5}}$

Next, suppose the amount become 8 times in x years.

$\therefore 8P = P\left(1+\frac{r}{100}\right)^n$ or $8 = \left(1+\frac{r}{100}\right)^n$ or

$8 = \left(2^{\frac{1}{5}}\right)^n$ or $2^3 = 2^{\frac{n}{5}}$

$\therefore 3 = \frac{n}{5}$ or n = **15 years.**

678. Suppose two numbers are x and y. By hypothesis,

$x^2 + y^2 = 145$

$\sqrt{x} = 3$ or x = 9

$\therefore 81 + y^2 + 145$ or $y^2 = 64$

679. $\frac{4335}{4(?)24} \div 1\frac{7}{8} = \frac{289}{528}$ or $\frac{4335}{4(?)24} \div \frac{15}{8} = \frac{289}{528}$

or $\frac{4335}{4(?)24} \div \frac{8}{15} = \frac{289}{528}$

$\therefore 4(?)24 = \dfrac{4335\times8\times528}{15\times289}$

$4(?)24 = 4224 \quad \therefore \quad ? = \mathbf{2}$

680. Mean of eight numbers = 38.4

$\therefore$ Total of eight numbers = $38.4\times8 = 307.2$

Mean of seven numbers = 39.2

$\therefore$ Total of seven numbers = $39.2\times7 = 274.4$

Hence, eighth number = $307.2 - 274.4 = \mathbf{32.8}$

681. Suppose three consecutive even numbers are $2x-2$, $2x$, $2x+2$; By hypothesis,

$\dfrac{(2x-2)2x(2x+2)}{8} = 720$ or

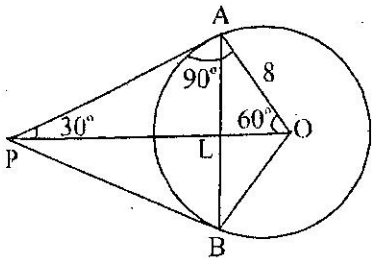
$(2x-2).2x.(2x+2) = 720\times8 = 5760$

Hence, $\dfrac{(2x-2)2x(2x+2)}{8} = 720$

$= \sqrt{(2x-2)2x(2x+2)} = \sqrt{5760}$

$= \sqrt{8^2\times3^2\times10} = 8\times3\sqrt{10} = \mathbf{24\sqrt{10}}$

682. $\angle AOP = 180°-(90°+30°) = 180°-120° = 60°$



$\therefore$ From right angled ΔAOL,

$\cos60° = \dfrac{OL}{OA}$,

$\sin60° = \dfrac{AL}{AO}$ or $\dfrac{1}{2} = \dfrac{OL}{8}$, $\dfrac{\sqrt{3}}{2} = \dfrac{AL}{8}$

or $OL = 4$, $AL = 4\sqrt{3}$

Hence, Area of $\Delta AOB = \dfrac{1}{2}\times AB\times OL$

$= AL\times OL = 4\sqrt{3}\times4 = \mathbf{16\sqrt{3}}$

683. $\dfrac{24.23\times1.423\times34.21}{521.3\times413.32\times2.53}$

$= \dfrac{2423\times1423\times3421\times10\times100\times100}{100\times1000\times100\times5213\times41332\times253}$

$= \dfrac{\frac{2423}{1000}\times\frac{1423}{100}\times\frac{3421}{10}}{\frac{5213}{100}\times\frac{41322}{10}\times\frac{253}{100}}$

$= \dfrac{2.423\times14.23\times342.1}{521.3\times4132.2\times2.53}$

684. As $1497375 = 5^3\times11^3\times3^2$, so it must be multiplied by 3 to give a perfect cube.

685. Suppose Marked Price = Rs. x

$\therefore$ Discounted Price = Rs. $x\times\dfrac{100-10}{100}$

or S.P. of watch = Rs. $x\times\dfrac{90}{100}$ = Rs. $\dfrac{9}{10}x$;

C.P. of watch = Rs. 450

$\therefore$ Profit = Rs. $\left(\dfrac{9}{10}x-450\right)$

$\therefore$ Profit % $= \dfrac{\frac{9}{10}x-450}{450}\times100 = \dfrac{9x-4500}{45}\%$

By hypothesis, $\dfrac{9x-4500}{45} = 12$

or $9x - 4500 = 540$ or $9x = 5040$

$\therefore x = \mathbf{Rs.\ 560}$

686. Slant height,

$= \sqrt{r^2+h^2} = \sqrt{7^2+14^2} = \sqrt{49+196} = \sqrt{245}$

Total surface of a cone $(\pi r^2+\pi rl) = \pi(49+7\sqrt{245}) = \dfrac{22}{7}\left[49+7\sqrt{245}\right]$

$= 22(7+\sqrt{245}) == 22(7+15.6\sqrt{2})$

$= 22\times22+6\sqrt{2} = 498.344\ cm^2 = \mathbf{498.35cm^2}$

687. If the number is, x, then by hypothesis,

$x = \dfrac{1}{x}+\dfrac{1}{8}\times34 = \dfrac{17}{4}$ or $4x^2+4 = 17x$ or

$4x^2-17x+4 = 0$ or $4x^2-16x-x+4 = 0$

or $4x(x-4)-1(x-4) = 0$

or $(x-4)(4x-1) = 0$

$\therefore x = 4$ or $1/4$

Hence, product of number and its square root

$= 4\times\sqrt{4} = 4\times2 = 8$ or $\dfrac{1}{4}\times\dfrac{1}{\sqrt{4}} = \dfrac{1}{4\times2} = \dfrac{1}{8}$

688. Here r = 7 cm, h = 10 cm

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

$= 2\pi r(h + r) = 2 \times \frac{22}{7} \times 7(7 + 10)$

$= 44 \times 17 =$ **748 cm².**

689. 70% of 280 = $\frac{70}{100} \times 280 = \frac{40}{100} \times 490$

= **40% of 490.**

690. $51.8 \div 18.5 = \frac{51.8}{18.5} = \frac{5180}{185} \times \frac{1}{10}$

$= 28 \times \frac{1}{10} =$ **2.8**

691. Suppose C.P. of transistor = Rs. x;

S.P. = Rs. 572

$\therefore$ Profit = Rs. (572 – x). By hypothesis,

$572 - x = 30\%$ of $x = \frac{30}{100}x = \frac{3}{10}x$

or $5720 - 10x = 3x$ or $13x = 5720$

$\therefore x =$ **Rs. 440.**

692. Suppose the two numbers are x and y. By Hypothesis,

$x + y = \frac{28}{25}x = x + \frac{3}{25}x$

$\therefore y = \frac{3}{25}x = \frac{12}{100}x =$ **12% of x.**

693. $\frac{(67.542)^2 - (32.458)^2}{75.458 - 40.374}$

$= \frac{(67.542 - 32.458)(67.542 + 32.458)}{35.084}$

$= \frac{35.084 \times 100.000}{35.084} =$ **100**

694. P = 1000 Rs. A = 5000, n = 4

The formula is $A = P\left(1 + \frac{r}{100}\right)^n$

$\therefore 5000 = 1000\left(1 + \frac{r}{100}\right)^4$

$\therefore \left(1 + \frac{r}{100}\right)^4 = \frac{5000}{1000} = 5;\ 1 + \frac{r}{100} = 1.50$

$\frac{r}{100} = 1.50 - 1 = .50;\ \therefore r = .5 \times 100 =$ **50 %**

695. Total population = 4500 + 7500 = 12000

Increase = $12000 \times \frac{25}{100} = 3000$

Increase in the first group = $4500 \times \frac{20}{100} = 900$.

Increase in the 2nd group = 3000 – 900 = 2100

$\therefore$ % of increase = $\frac{2100 \times 100}{7500} =$ **28%**

696. Time = $\frac{40}{60}$ hr = $\frac{2}{3}$ hr, Speed = 54 kmph;

$\therefore$ Distance = $54 \times \frac{2}{3} = 36$ km

Now, distance = 36 km, time = $\frac{30}{60}$ hr = $\frac{1}{2}$ hr.

New speed = $36 \times 2 =$ **72 kmph.**

697. Total distance to be covered = 220 + 220 = 440m

Effective speed of crossing = 45 + 54 = 99 kmph

$\frac{\text{Speed}}{\text{Distance}} = \text{time};$

Time = $\frac{400}{99 \times \frac{5}{18}} =$ **16 seconds.**

698. Let speed of swimming of the person in still water be 'x' kmph

Speed of the current 'y' kmph

Thus x + y = 6 and x – y = 2

$\therefore$ **x = 4 kmph and y = 2 kmph**

699. Part filled by A in 1 hr = $\frac{1}{20}$;

Part filled by B in 1 hr = $\frac{1}{30}$

Part filled by (A + B) in 1 hr = $\left(\frac{1}{20} + \frac{1}{30}\right)$

$= \frac{30 + 20}{600} = \frac{1}{12}$

Hence, both the pipes together will fill the tank in 12 hrs

700. A's 1 hr work = $\frac{1}{10}$; B's 1 hr work = $\frac{1}{12}$

(A + B)'s 1 hr work = $\left(\frac{1}{10} + \frac{1}{12}\right) = \frac{22}{120} = \frac{11}{60}$

$\therefore$ Both the taps can fill the tank in $\frac{60}{11}$ hrs

(or) $5\frac{5}{11}$ **hrs**