

Section-A :

1. After pattern study or study of numbers, it was found out that square numbers could be expressed as sum of consecutive odd numbers.

$$16 = \underline{1+3+5+7} \quad (\text{first four consecutive odd numbers}).$$

$= 1^2 \uparrow$

$$16-1 = 15$$

$$15-3 = 12$$

$$12-5 = 7$$

$$7-7 = 0, \text{ hence, } 16 = 1+3+5+7.$$

2. $3^x = 81$, factorisation of 81 -

$$81 = 3 \times 3 \times 3 \times 3$$
$$= 3^4.$$

$$\begin{array}{r|l} 3 & 81 \\ \hline 3 & 27 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$3^x = 3^4, \text{ means, } x=4 \quad (\text{when bases are same, powers will become}).$$

if $\alpha = 4$

2^α means $2^4 = 2 \times 2 \times 2 \times 2$
 $= 16.$

$\therefore$ the value of $2^\alpha = 16$ (where $\alpha = 4$)

3. initial population of village = 1000. (P)

net growth rate = birth rate - death rate.
 $= 10\% - 3\%.$
 $= 7\%$

① population after one year = ~~simple~~ $P \left(1 + \frac{R}{100}\right)^t$
(t)

where P = population

R = rate of growth

t = time.

$1000 \left(1 + \frac{7}{100}\right)^1 = 1000 \times \left(\frac{107}{100}\right)^1 = \frac{107000}{100}$
 $= 1070.$

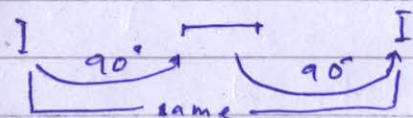
or, directly = $\frac{10}{100} \times 7 \times 1 + 1000 = 70 + 1000 = 1070$

∴ the population after 1 year = 1070, because.

net growth percent = 7% and 7% of 1000 = $\frac{7}{100} \times 1000 = 70$

So, total population = $1000 + 70 = 1070$.

1. I (9th alphabet).

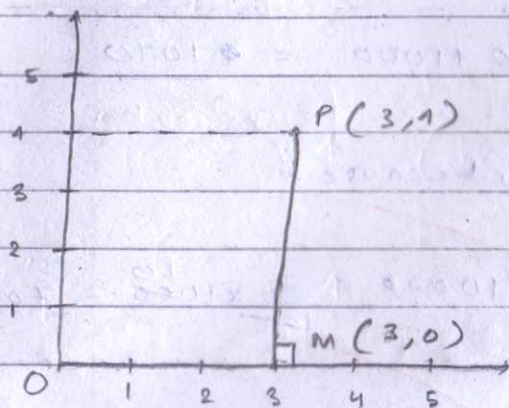


after 180° it looks similar,

① means order of rotation = $\frac{360^\circ}{180^\circ} = 2$

∴ from amongst the alphabets of "POSITIVE", I has rotational symmetry of order 2.

5.



here, M lies on x-axis, and its co-ordinates are, $(3, 0)$.

If $PM \perp x\text{-axis}$, P is a point, $(3, 4)$.
then co-ordinates of M are $(3, 0)$.

6. the figure is a pentagon (5-sides).

$$\begin{aligned} \text{Sum of all angles} &= 180 \times (5-2) \\ &= 180 \times 3 = 540. \end{aligned}$$

$$90^\circ + 120^\circ + 100^\circ + 108^\circ + L_1 = 540^\circ$$

$$\begin{aligned} \angle L_1 &= 540^\circ - (90^\circ + 120^\circ + 100^\circ + 108^\circ) \\ &= 540^\circ - 418^\circ = 122^\circ. \end{aligned}$$

$$\angle 1 + \angle x = 180^\circ \text{ (}\angle 1 \text{ and } x \text{ are linear pair).}$$

$$\text{meanwhile, } 122^\circ + x = 180^\circ$$

$$x = 180^\circ - 122^\circ$$

$$= 58^\circ$$

$$\therefore [x = 58^\circ]$$

Section B:

$$\sqrt[3]{61 + 3\sqrt{25 + 3\sqrt{8}}} \Rightarrow \sqrt[3]{61 + 3\sqrt{25 + 3\sqrt{2 \times 2 \times 2}}}$$

$$\Rightarrow \sqrt[3]{61 + 3\sqrt{25 + 2}} = \sqrt[3]{61 + 3\sqrt{27}}$$

$$\Rightarrow \sqrt[3]{61 + 3\sqrt{3 \times 3 \times 3}} = \sqrt[3]{61 + 3 \times 3}$$

$$= \sqrt[3]{64} = 4$$

$$\therefore \sqrt[3]{61 + 3\sqrt{25 + 3\sqrt{8}}} = 4$$

$$\begin{array}{r|l} 2 & 8 \\ \hline 2 & 4 \\ \hline 2 & 2 \\ \hline & 1 \end{array} \quad 8 = 2 \times 2 \times 2$$

$$\begin{array}{r|l} 3 & 27 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array} \quad 27 = 3 \times 3 \times 3$$

$$\begin{array}{r|l} 2 & 64 \\ \hline 2 & 32 \\ \hline 2 & 16 \\ \hline 2 & 8 \\ \hline 2 & 4 \\ \hline & 2 \end{array} \quad \begin{array}{l} \sqrt[3]{64} = 2 \times 2 = 4 \\ 64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \end{array}$$

8.

$$\begin{array}{c} \text{LHS} \\ \frac{5x}{2} - 4 \end{array} = \begin{array}{c} \text{RHS} \\ \frac{3x}{5} \end{array}$$

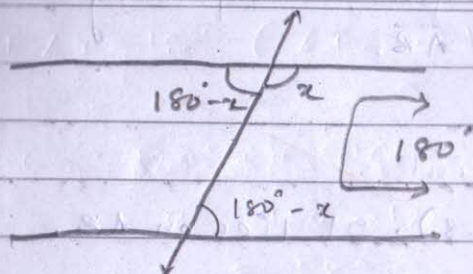
$$\frac{5x}{2} - \frac{3x}{5} = 4 \quad \left(\begin{array}{l} \text{transposition of 4 from LHS to RHS and} \\ \text{of } \frac{3x}{5} \text{ from RHS to LHS with change} \\ \text{of sign).} \end{array} \right.$$

$$\frac{(5x \cdot 5) - (3x \cdot 2)}{10} = 4$$

$$\frac{25x - 6x}{10} = 4 \Rightarrow \frac{19x}{10} = 4 \Rightarrow 19x = 4 \times 10 \quad (\text{cross multiplication})$$

$$19x = 40 \Rightarrow \boxed{x = \frac{40}{19}}$$

∴ After solving for 'x' in the eqⁿ we get 'x' as $\frac{40}{19}$.



the sum of two angles in Interior of the same side of the transversal is 180° always.

here, too in the question $\angle 1 + \angle 2 = 180^\circ$ and

② $\boxed{\angle 1 = 2\angle 2}$

if $\angle 2 = x$

$\angle 1 = 2 \cdot x = 2x$

$\angle 2 + \angle 1 = 180^\circ = x + 2x$

$180^\circ = 3x$, $\boxed{x = \frac{180^\circ}{3} = 60^\circ}$, if $x = 60^\circ$

$\angle 2 = 60^\circ = x$

$\angle 1 = 2 \cdot x = 2 \cdot 60^\circ = 120^\circ$

∴ the measure of $\angle 1 = 120^\circ$

$\angle 2 = 60^\circ$

10. After plotting $A(2,1)$ and $B(5,2)$ on graph, and joining them, we get a graph line segment $\overline{AB}$.

On, this ^{line} segment $\overline{AB}$ lie infinite point.

The co-ordinate of one point C' is $(1,3)$. It lies on $\overline{AB}$.

11. Yes it is a polyhedron. It satisfies the Euler's formula.

no. of faces :- 8 (F)

vertices :- 6 (V)

edges :- 12 (E)

$$F + V = E + 2$$

$$8 + 6 = 12 + 2$$

✓ absolutely true.

It is a polyhedron. Polyhedron is a 3-D shape, having 2D shapes or plane surfaces as its faces. All Polyhedrons satisfy Euler's formula.

12. ₹2 coins $\longrightarrow$ 20

₹5 coins $\longrightarrow$ 14

₹10 coins $\longrightarrow$ 16

total coins $\longrightarrow$ 50

2 probability = $\frac{\text{no. of favourable outcomes}}{\text{total no. of possible outcomes of a event.}}$

(i) ₹5 probability = $\frac{14}{50} = \frac{7}{25}$ (14 ₹5 coins)
(total 50 coins).

(ii) ₹10 probability = $\frac{16}{50} = \frac{8}{25}$ (16 ₹10 coins)
(total 50 coins).

Section C :

13. If $\sqrt{a} \times \sqrt{b} = \sqrt{a \times b}$, then to find :-

$$\sqrt{3675} \times \sqrt{2852}$$

↓
↓
(i)
(ii)

$$\begin{array}{r} \text{(i)} \quad 6 \overline{) 3675} \\ \underline{36} \\ 075 \\ \underline{072} \\ 3 \end{array}$$

$$\begin{array}{r} \text{(ii)} \quad 2 \overline{) 2852} \\ \underline{2} \\ 852 \\ \underline{840} \\ 12 \\ \underline{10} \\ 2 \end{array}$$

$$\text{(i)} \quad \sqrt{3675} = \sqrt{5 \times 5 \times 7 \times 7 \times 3}$$

$$\text{(ii)} \quad \sqrt{2852} = \sqrt{2 \times 2 \times 2 \times 2 \times 7 \times 7 \times 3}$$

$$\sqrt{3675} \times \sqrt{2852} = \sqrt{a} \times \sqrt{b} = \sqrt{ab}$$

$$\sqrt{3675} \times \sqrt{2852} = \sqrt{3675 \times 2852}$$

$$= \sqrt{\underbrace{5 \times 5}_{\downarrow} \times \underbrace{7 \times 7}_{\downarrow} \times \underbrace{7 \times 7}_{\downarrow} \times \underbrace{2 \times 2}_{\downarrow} \times \underbrace{2 \times 2}_{\downarrow} \times \underbrace{3 \times 3}_{\downarrow}}$$

$$= 5 \times 7 \times 7 \times 2 \times 2 \times 3$$

$$= 2940$$

∴ by $\sqrt{a} \times \sqrt{b} = \sqrt{a \times b}$, we have solved $\sqrt{8695} \times \sqrt{2352}$ and got 2940 as the solⁿ.

14. $\left[9 \left(64^{\frac{1}{3}} + 125^{\frac{1}{3}} \right)^3 \right]^{\frac{1}{4}}$. first we have to simplify the innermost bracket.
 $(64^{\frac{1}{3}} + 125^{\frac{1}{3}})$.

③ $\begin{array}{r|l} 2 & 64 \\ \hline 2 & 32 \\ 2 & 16 \\ 2 & 8 \\ 2 & 4 \\ 2 & 2 \end{array}$ $64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2$
 $\sqrt[3]{64} = 2 \times 2 = 4$
 $\begin{array}{r|l} 5 & 125 \\ \hline 5 & 25 \\ 5 & 5 \end{array}$ $125 = 5 \times 5 \times 5$
 $\sqrt[3]{125} = 5$

$64^{\frac{1}{3}}$ means $\sqrt[3]{64}$ and $125^{\frac{1}{3}}$ means $\sqrt[3]{125}$, (because $x^{\frac{a}{b}} = \sqrt[b]{x^a}$).

∴ $(64^{\frac{1}{3}} + 125^{\frac{1}{3}}) = (\sqrt[3]{64} + \sqrt[3]{125}) = 4 + 5 = 9$ ✓

then, again $\left(64^{\frac{1}{3}} + 125^{\frac{1}{3}}\right)^3 = (9)^3 = 9^3$

then, $\left[9\left(64^{\frac{1}{3}} + 125^{\frac{1}{3}}\right)^3\right] = [9 \times (9)^3] = 9^1 \times 9^3$

$= [9^{1+3}] = 9^4 \quad (\because a^b \times a^c = a^{b+c})$

finally, $\left[9\left(64^{\frac{1}{3}} + 125^{\frac{1}{3}}\right)^3\right]^{\frac{1}{4}} = [9 \times 9^3]^{\frac{1}{4}} = (9^4)^{\frac{1}{4}}$

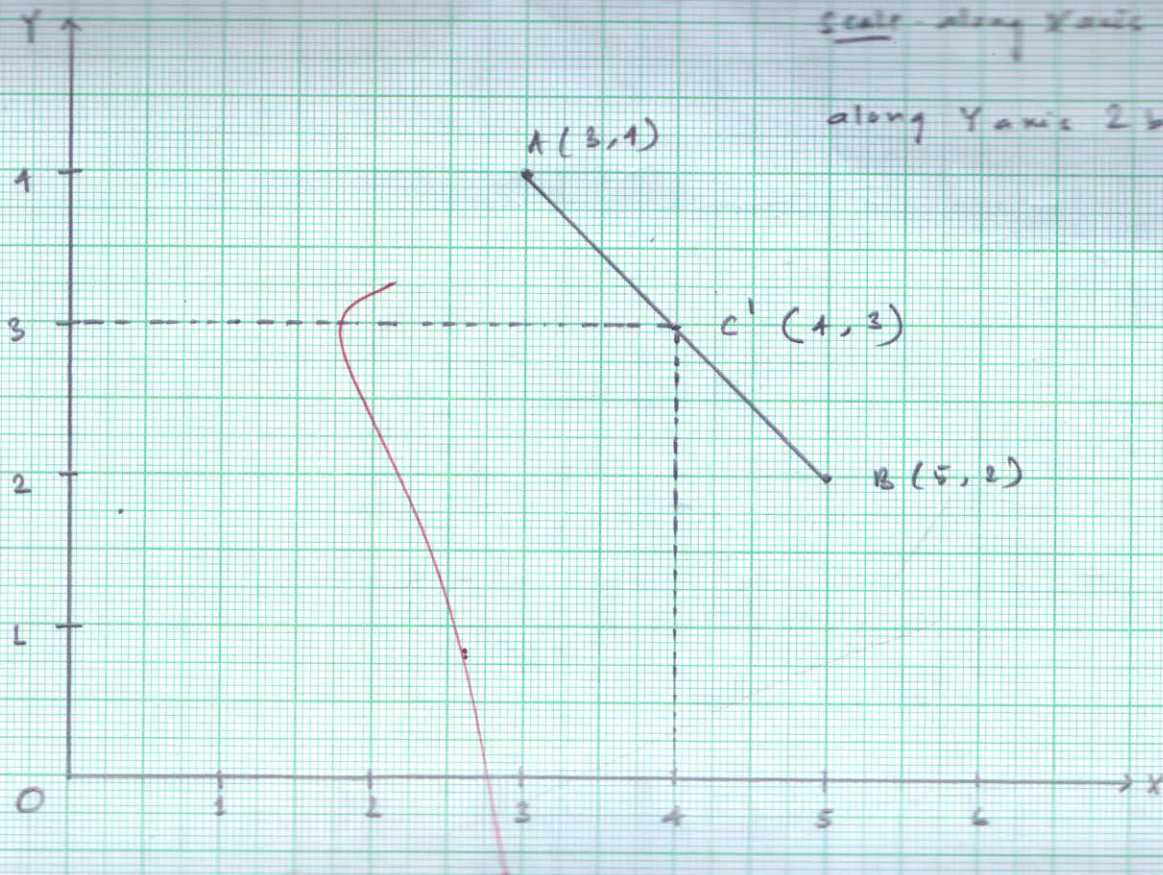
$9^{4 \times \frac{1}{4}} = 9^1 = 9 \quad (\because (a^b)^c = a^{b \times c})$

$\therefore$ after the simplification of $\left[9\left(64^{\frac{1}{3}} + 125^{\frac{1}{3}}\right)^3\right]^{\frac{1}{4}} =$ we get $\textcircled{9}$

as the answer.

16.

Scale along X-axis 2 big divisions = 1 unit
along Y-axis 2 big divisions = 1 unit



72

15. given information:-

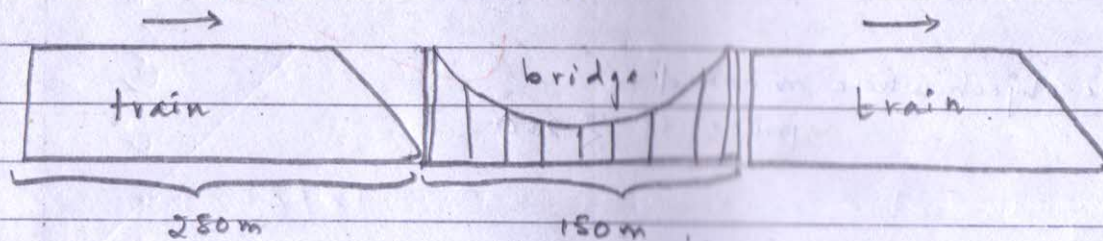
length of moving train = 250 m

length of bridge to be crossed = 150 m.

speed of the train = 72 kmph

conversion to m/s $\rightarrow$ as all other units are in m (metre).

$$= \frac{72 \times 1000}{3600} = 20 \text{ m/s} \quad \left(\because 1 \text{ km} = 1000 \text{ m}, \right. \\ \left. 1 \text{ hr} = 3600 \text{ sec.} \right)$$



total distance to be covered = from the above it can be clearly known the distance to be travelled is sum of length of bridge and train

$$= 250 \text{ m} + 150 \text{ m} = 400 \text{ m.}$$

(train) (bridge)

time it will take = $\frac{\text{distance}}{\text{speed}}$ } where both are known quantities and in same unit.

$$= \frac{400 \text{ m}}{20 \text{ m/s}} = \frac{400 \text{ m} \cdot \text{s}}{20 \text{ m}} = 20 \text{ seconds.}$$

16. given data :

marked price of object = ₹ 280.

discount = 20 %.

profit percent = 12 %.

to find :

cost price of the object whose marked price is ₹ 280.

$$\text{Selling price} = \text{marked price} \times \frac{(100 - \text{discount \%})}{100}$$

$$= 280 \times \frac{(100 - 20)}{100} = 280 \times \frac{80}{100} = ₹ 224.$$

Still he earns a profit of 12 %.

Let the CP be x.

$$\text{then SP} = \text{CP} \times \frac{(100 + \text{profit \%})}{100} \Rightarrow 224$$

$$= x \times \frac{(100 + 12)}{100} \Rightarrow 224$$

$$\frac{112x}{100} = 224, \quad \boxed{x = ₹ 200}$$

As, CP was x , therefore the CP = ₹ 200.

$\therefore$ the cost price of the article = ₹ 200, whose Marked price is ₹ 280.
and makes 12% profit after 20% discount.

17. If the rate of depreciation is constant then,

$$P \left(1 - \frac{R}{100}\right)^n \text{ where, } P = \text{amount (initial)}$$

$R = \text{rate of depreciation}$

$n = \text{time period}$

here, we know the rate = 10% per annum

time = 3 years.

but, we have to find initial amount.

Let it be x .

$$x \left(1 - \frac{10}{100}\right)^3 = x \left(\frac{9}{10}\right)^3 = x \cdot \frac{729}{1000} \Rightarrow \boxed{3,82,725}$$

present cost.

$$x = \frac{525}{\frac{729}{1000}} \times \frac{1000}{729}$$

$$= 5,25,000$$

$$\begin{array}{r|l} 729 & 3,82,725 \\ \hline 3645 & \\ 1822 & \\ 1759 & \\ \hline 3645 & \\ 2645 & \\ \hline 0 & \end{array}$$

total depreciation = initial amount - present worth/value.

$$= 5,25,000 - 3,82,725$$

$$= [1,42,275]$$

$$\begin{array}{r} 5,25,000 \\ - 3,82,725 \\ \hline 1,42,275 \end{array}$$

$$5,25,000$$

i.e., the car's cost 3 years ago was ~~4,42,275~~ and the total depreciation = 1,42,275.

18

$$a^2 + \frac{1}{4}b^2 + \frac{1}{9}c^2 + ab - \frac{1}{3}bc - \frac{2}{3}ca.$$

this polynomial contains 6 terms, means it suggests,

$$(a+b+c)^2. (a+b+c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ac.$$

$$a^2 + \frac{1}{4}b^2 + \frac{1}{9}c^2 + ab - c\left(\frac{1}{3}b + \frac{2}{3}a\right)$$

In the last two terms, $-c$ can be taken as common, means either (c is negative) or (both a, b are negative).

* preferable.

$$\left[\begin{aligned} & (a)^2 + \left(\frac{1}{2}b\right)^2 + \left(\frac{-1}{3}c\right)^2 + \left(2 \cdot a \cdot \frac{1}{2}b\right) + \left(2 \cdot \frac{1}{2}b \cdot \frac{-1}{3}c\right) + \left(2 \cdot a \cdot \frac{-1}{3}c\right) \\ & = \left(a + \frac{1}{2}b + \frac{-1}{3}c\right)^2 = \left(a + \frac{b}{2} - \frac{c}{3}\right)^2 = \left(a + \frac{b}{2} - \frac{c}{3}\right)\left(a + \frac{b}{2} - \frac{c}{3}\right). \end{aligned} \right]$$

or

$$\begin{aligned} & (-a)^2 + \left(\frac{-1}{2}b\right)^2 + \left(\frac{1}{3}c\right)^2 + \left(2 \cdot -a \cdot \frac{-1}{2}b\right) + \left(2 \cdot \frac{-1}{2}b \cdot \frac{1}{3}c\right) + \left(2 \cdot -a \cdot \frac{1}{3}c\right) \\ & = \left((-a) + \left(\frac{-b}{2}\right) + \frac{c}{3}\right)^2 = \left(\frac{c}{3} - \frac{b}{2} - a\right)^2 = \left(\frac{c}{3} - \frac{b}{2} - a\right)\left(\frac{c}{3} - \frac{b}{2} - a\right). \end{aligned}$$

19. for a polynomial to be a factor of another polynomial it must leave 0 as the remainder, and should have a polynomial as quotient.

Let's, check a problem using long division method:-

to prove, $(3x+2)$ is a factor of $(12x^3 + 20x^2 + 11x + 2)$.

means $\frac{12x^3 + 20x^2 + 11x + 2}{3x+2} = k \text{ (R=0)}$.

3

$$\begin{array}{r|l} 3x+2 & 12x^3 + 20x^2 + 11x + 2 \\ \underline{12x^3 + 6x^2} & \downarrow \\ & 14x^2 + 11x + 2 \\ \underline{12x^2 + 8x} & \downarrow \\ & 2x^2 + 3x + 2 \\ \underline{2x^2 + 4x} & \downarrow \\ & -x + 2 \\ \underline{-x + 2} & \\ & 0 \end{array}$$

here, according to division algorithm:-

$$12x^3 + 20x^2 + 11x + 2 = (3x+2)(4x^2 + 4x + 1) + 0$$

(dividend = divisor $\times$ quotient + remainder).

$\therefore$ It shows that, $(3x+2)$ divides $11x+20x^2+12x^3+2$ without leaving any remainder.

20. In the figure it is shown that 50° and x form a linear

means, $x+50 = 180^\circ$

$$\boxed{x = 130^\circ}$$

3 It also shows that y and 130° are vertically opposite angle

$$\boxed{y = 130^\circ}$$

$\Rightarrow$ x, y are alternate interior angle. According to the converse law of parallel lines, If alternate interior angles are parallel between a transversal means, the lines carrying the angles are parallel.

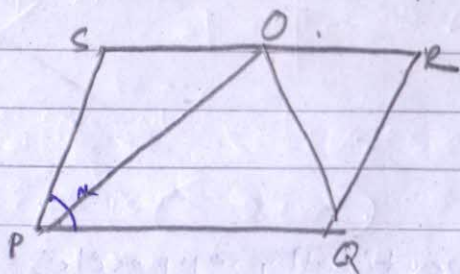
$\Rightarrow$ It states that PQ is the transversal and $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ lines carry $\angle x$ and $\angle y$ and hence they are parallel.

$$\therefore \angle x = 180^\circ$$

$$\angle y = 180^\circ$$

and it is proved by converse law of parallel lines that $AB \parallel CD$.

21.



It is given that the bisectors of $\angle P$ and $\angle Q$ meet at O.

Suppose $\angle SPQ = x$, means

$\angle RQP = 180 - x$, because sum of adjacent angles of a parallelogram sum is 180° .

$$\text{bisector of } \angle P (\angle SPQ) = \frac{x}{2} = \angle OPQ$$

$$\text{bisector of } \angle Q = \frac{(180-x)}{2} = \angle OQP$$

In ΔOPQ by angle sum property $\angle POQ + \angle OPQ + \angle OQP = 180^\circ$

$$\Rightarrow \angle POQ + \frac{x}{2} + \frac{(180-x)}{2} = 180^\circ$$

$$\Rightarrow \angle POQ + \frac{180-x+x}{2} = 180^\circ$$

$$\Rightarrow \angle POQ + 90^\circ = 180^\circ \Rightarrow \boxed{\angle POQ = 90^\circ}$$

$\therefore$ By the above process it is shown that $\angle POQ = 90^\circ$.

22. Area of Base of a right circular cylinder = 154 cm^2

means, $\pi r^2 = 154 \text{ cm}^2$ (because, the base of a cylinder is a circle).
here, r is the radius of the base.

$$\frac{22}{7} \times r^2 = 154 \text{ cm}^2$$

$$r^2 = 7 \times 7 \text{ cm}^2 = (49)$$

$$\boxed{r = 7 \text{ cm}}$$

It is also known that $\boxed{\text{height } (h) = 8 \text{ cm}}$

curved surface area = $2\pi r h$

$\swarrow$ $\searrow$ $\nearrow$
 π r height
 $(\frac{22}{7})$ radius of the base

$$2 \times \frac{22}{7} \times 2 \times 8 = 22 \times 2 \times 8 \text{ cm}^2$$

$$= \boxed{352 \text{ cm}^2}$$

$\therefore$ the curved surface area of a cylinder having base area of 154 cm^2 is $\boxed{352 \text{ cm}^2}$.

Section - D :-

23. levelling a square lawn means covering the whole area of the lawn.

If its side is a metre, then area = $a^2 \text{ m}^2$

and the cost of levelling is ₹ 2.50 per m^2 .

If the total cost of levelling is ₹ 13322.50,

Total cost = total area of lawn ^(in m²) × cost of levelling per m²

$$₹13322.50 = ₹2.50 \times a^2 \text{ (assumption)}$$

$$a^2 = \frac{13322.50}{2.50} = \frac{26645}{5} = 5329$$

$$\begin{array}{r} 7 \overline{) 5329} 173 \\ \underline{14} \\ 19 \\ \underline{14} \\ 49 \\ \underline{49} \\ 0 \end{array}$$

square root of
 $5329 = 73$

if $a^2 = 5329 \text{ m}^2$

then $a = 73 \text{ m}$

fencing means covering the whole boundary of the lawn.

total length covered by fencing = $4 \times a$ (side of square lawn).

cost of fencing = ₹5 per metre

Total cost of fencing = cost of fencing per metre × total length of boundary (in m)

$$= ₹5 \times (73 \times 4)$$

$$= 5 \times 292$$

$$= ₹1460.$$

∴ the cost of fencing the square lawn at ₹ 2.50 per 5 perm is ₹1460.

24. Let the sum be ₹ (P)

Given : rate of interest = 15% per annum. (R)

time = 3 years. (T)

difference between compound interest and simple interest = ₹1134

4

$$SI = \frac{P \times R \times T}{100} = \frac{x \times 15 \times 3}{100} = \frac{9x}{20}$$

$$CI = \left\{ P \left(1 + \frac{R}{100} \right)^T \right\} - P = \left\{ x \left(1 + \frac{15}{100} \right)^3 \right\} - x$$

$$= \left\{ x \left(\frac{23}{20} \right)^3 \right\} - x$$

$$= \frac{12167x}{8000} - x$$

$$= \frac{4167x}{8000}$$

$$\begin{array}{r} 23 \times 23 \\ 529 \\ 23 \\ \hline 1547 \\ 1058 \\ \hline 12167 \end{array}$$

$$\begin{array}{r} 12167 \\ 8000 \\ \hline 4167 \end{array}$$



ADDITIONAL SHEET
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Additional Sheet No.

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$$\text{difference between CI and SI} = \frac{4167x}{8000} - \frac{7x}{2000} = \frac{4167x - 3600x}{8000}$$

$$\frac{567x}{8000} = ₹1134 \text{ (given)}$$

$$x = ₹ \left(\frac{1134^2 \times 8000}{567} \right) = ₹16000.$$

∴ the sum is ₹16000, for which difference of CI and SI is 1134

25. $(2a+3b)^2 + 2(2a+3b)(2a-3b) + (2a-3b)^2$

This question is based on substitution of terms.

In the above case, there are only 2 terms available : — $\begin{matrix} (2a+3b) \\ (2a-3b) \end{matrix}$

we can take, $\begin{cases} (2a+3b) \text{ as 'x'} \\ (2a-3b) \text{ as 'y'} \end{cases}$

then by substituting with their respective variables we get :-

$$[x^2 + 2 \cdot x \cdot y + y^2] \longrightarrow \text{this suggests and refers to a identity}$$

$$\text{Identity I :- } (x+y)^2 = x^2 + 2 \cdot x \cdot y + y^2 \cdot ((x+y)(x+y))$$

$$\text{hence, } x^2 + 2 \cdot x \cdot y + y^2 = (x+y)^2.$$

4 this case therefore relates to $(x+y)^2$, i.e. $x^2 + 2 \cdot x \cdot y + y^2$. and now we again need to substitute the values so that the case can be solved or simplified.

$$(a+b)^2 = ((2a+3b) + (2a-3b))^2$$

$$= (2a+3b+2a-3b)^2 = (2a+2a)^2 = (4a)^2$$

$$= 4a \cdot 4a = (16a^2).$$

∴ after simplifying using suitable identity of $(x+y)^2$, we get the answer as $(4a)^2 = 16a^2$

26. given information:

here we have to take a two digit no. — $\overline{xy}$ (whose ^{expanded} ~~place~~ value sum is $10x+y$)

sum of the no. and reverse — ~~150~~ 165. ✓

if the digits differ by 3, we have to find the ~~ten~~ number.

It is also given ten's digit > one's digit, means $\boxed{x > y}$.

4. Now summarizing fact and

concluding: sum of $10x+y$ and its reverse is 165.

$$(10x+y) + \overline{yx} = (10x+y) + (10y+x) = 11x + 11y = 165.$$

$$11(x+y) = 165 \quad | \quad 15$$

$$\boxed{x+y = 15}$$

sum of the digits = 15. $(x+y)$

difference of the digits = 3 $(x-y)$ given.

$$\begin{array}{rcl} x + y & = & 15 \quad \text{--- (i)} \\ + x - y & = & 3 \quad \text{--- (ii)} \end{array} \quad \left. \vphantom{\begin{array}{rcl} x + y & = & 15 \\ + x - y & = & 3 \end{array}} \right\} \text{adding both}$$

$$2x = 18$$

$$\boxed{x = 9}$$

now putting x in eqⁿ (i), we get $y = 15 - 9 = \boxed{6}$

now $\begin{array}{|c|} \hline x = 9 \\ \hline y = 6 \\ \hline \end{array} \left\{ \begin{array}{l} \text{it also satisfies all the conditions.} \end{array} \right.$

∴ The number = $\overline{xy}$ or $10x + y = \boxed{96}$



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Additional Sheet No.

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28. In $\triangle ABC$, of $\square ABDC$.

$$\angle ABC = 60^\circ \text{ (given)}$$

$$\text{also } AB = AC \text{ (given)}$$

$\triangle ABC$ is isosceles

The base angles of isosceles $\triangle$ s are equal, therefore

$$\text{In } \triangle ABC, \angle ABC = \angle ACB.$$

$$\boxed{60^\circ = \angle ACB = \angle ABC}$$

Now, $\angle A + \angle ABC + \angle ACB = 180^\circ$ (angle sum property of $\triangle$).

$$\angle A + 60^\circ + 60^\circ = 180^\circ$$

$$\angle A = 180^\circ - 120^\circ$$

$$\boxed{\angle A = 60^\circ}$$

In ΔBDC .

$$\angle BCD = 75^\circ \text{ (given)}$$

$$BD = CD \text{ (given)}$$

ΔBDC is an isosceles Δ .

The base angles of an isosceles Δ are equal meaning,
In ΔBDC , $\angle BCD = \angle CBD$.

$$75^\circ = \angle BCD = \angle CBD$$

$$\angle BCD + \angle CBD + \angle D = 180^\circ \text{ (angle sum property of } \Delta BCD)$$

$$\angle D + 75^\circ + 75^\circ = 180^\circ$$

$$\angle D = 180^\circ - 150^\circ$$

$$\angle D = 30^\circ$$

As we know that in quadrilateral $ABCD$, $\angle B = \angle ABC + \angle DBC$
 $= 60^\circ + 75^\circ$

$$\angle B = 135^\circ$$

also $\angle C = \angle ACB + \angle BCD$

$= 60^\circ + 75^\circ$

$\angle C = 135^\circ$

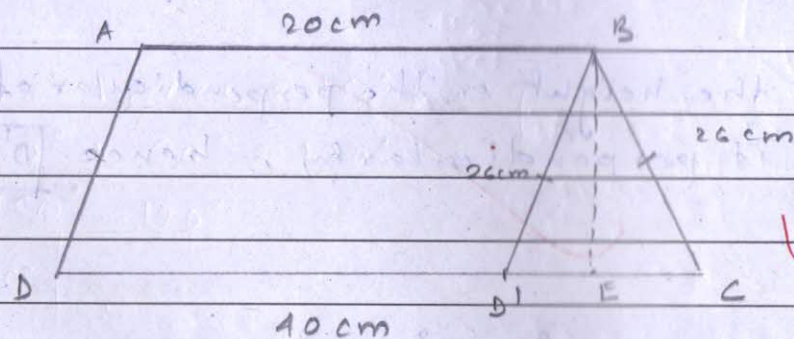
$\therefore$ all the angles of the quadrilateral ABDC are, $\angle A = 60^\circ$

$\angle B = 135^\circ$

$\angle C = 135^\circ$

$\angle D = 30^\circ$

29.



Given : parallel sides = 20 cm, 40 cm ($AB \parallel DC$)

non-parallel sides = equal and 26 cm.

construction of a line ^{segment} parallel to $\bar{AD}$ from point B and intersect at D' .

- construction of ~~the~~ the height of $\Delta BCD'$.

process: as we know that length of line segment remain same if they be parallel to each other and also lie between a set of parallel lines.

therefore we can say that $AD = BD' = 26 \text{ cm}$ and also we can infer that, $AB = DD' = 20 \text{ cm}$.

that means, $D'C = 20 \text{ cm}$ ($DC - DD'$)

4 As it is known that the height or the perpendicular of a isosceles to its base, bisects it perpendicularly, hence $D'E = EC = \frac{20 \text{ cm}}{2} = 10 \text{ cm}$

By pythagoras theorem, $10^2 + BE^2 = 26^2$

$$BE^2 = 676 - 100$$

$$(576) \text{ is } 24^2$$

$$BE = 24 \text{ cm}$$

therefore, the height of the trapezium as well as the Δ is 24 cm, because, it is perpendicular to base of trapezium

contd. in pg.

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(i) 1-2 hours ✓

(ii) 4-5 hours ✓

(iii) 34 students ✓

(iv) 14 students ✓

OR

$$\text{Cricket} = \frac{40}{100} \times 100 = 40\%$$

$$\frac{40}{100} \times 360^\circ = 144^\circ$$

$$\text{hockey} = \frac{30}{100} \times 100 = 30\%$$

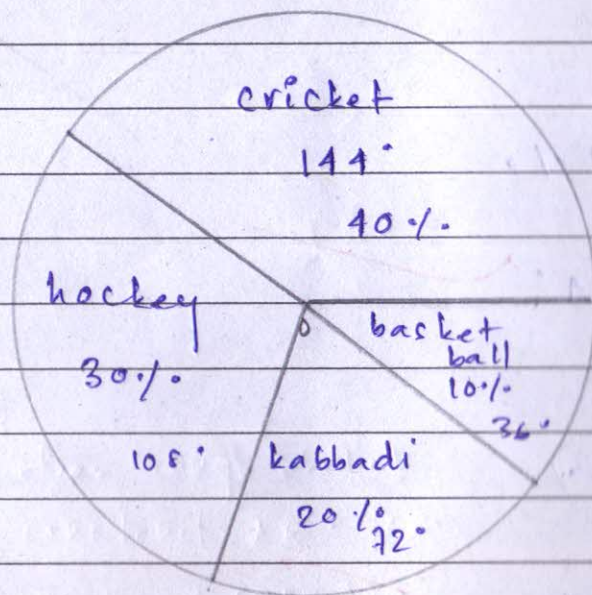
$$\frac{30}{100} \times 360^\circ = 108^\circ$$

$$\text{kabaddi} = \frac{20}{100} \times 100 = 20\%$$

$$\frac{20}{100} \times 360^\circ = 72^\circ$$

$$\text{Basket ball} = \frac{10}{100} \times 100 = 10\%$$

$$\frac{10}{100} \times 360 = 36^\circ$$



pie chart



ADDITIONAL SHEET
REGIONAL OFFICE, DAV INSTITUTIONS, ODISHA ZONE-I

(Please do not write your Name, Class, Roll No. or School's Name on this Additional Sheet)

Additional Sheet No.

3

Page No. 1

27. Area of trapezium = (sum of parallel sides) $\times$ (height) $\times \frac{1}{2}$.

parallel sides = 20cm, 40cm

sum = 20 + 40 = 60cm.

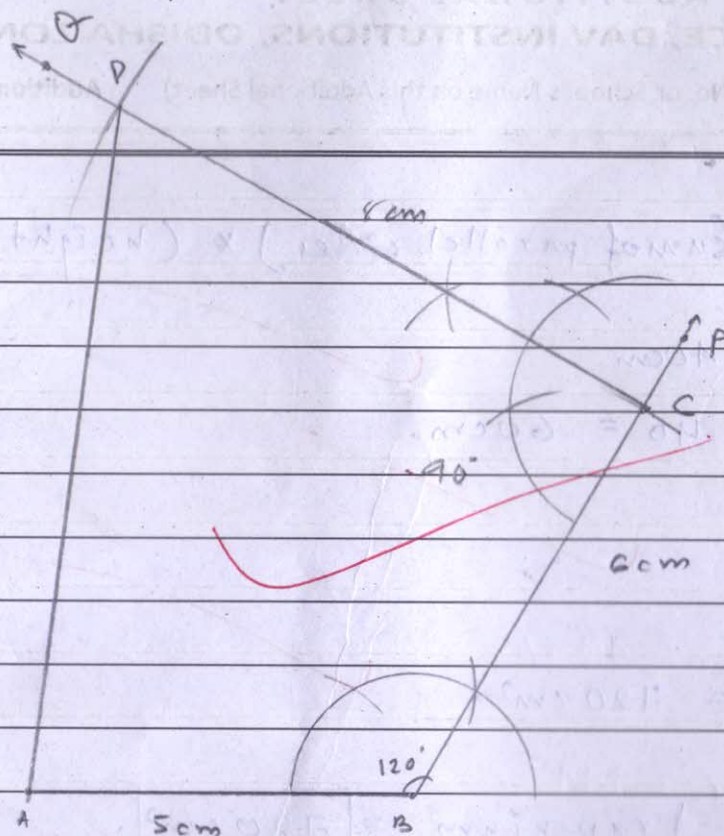
height = 24cm.

area = $\frac{1}{2} \times 60 \times 24 = 720 \text{ cm}^2$

$\therefore$ the area of the trapezium = 720 cm^2 .

27.

41



step 1: draw rough sketch

step 2: construct $AB = 5\text{ cm}$.

step 3: make $\angle ABP = 120^\circ$

step 4: ~~cut~~ cut $\overrightarrow{BP}$ at 6 cm from B at C .

step 5: make $\angle BCPQ = 70^\circ$

step 6: cut $\overrightarrow{CQ}$ at D at 8 cm from C .

step 7: join AD .

Your required quadrilateral is ready.

1. Sanjay ch. Pabse
DA 6/3/2020