Apptitude

Time & Work :

Q A can do a piece of work in 12 hours & B alone can do it in 15 hours. In how much time will they finish the whole work, together?

A → 12 hours
A → In 1 hours → $\frac{1}{12}$

B → 15 hours
B → In 1 hours → $\frac{1}{15}$

together = $\frac{1}{12} + \frac{1}{15} = \frac{9}{60} = \frac{3}{20}$ ← In 1 hours

A & B finish In → $\frac{20}{3}$ hour

Q A & B → 12 day , B → 30 days , A → ?

A & B in ~~Days~~ = $\frac{1}{12}$

B in day = $\frac{1}{30}$

A = $\frac{1}{12} - \frac{1}{30} \quad \frac{3}{60} = \frac{1}{20}$ In one day

A time → 20 days

Q A & B → 18 days , B & C → 24 days , C & A → 36 days
A, B & C → ? , A → ?

2(A, B, C) In day → $\frac{1}{18} + \frac{1}{24} + \frac{1}{36} = \frac{9}{72} = \frac{1}{8}$

A, B, C = $\frac{1}{16}$

A : $\frac{(A,B,C)}{\frac{1}{16}} - \frac{1}{24}(B\&C) = \frac{1}{48}$ In day

A take 48 day

Q A & B → 45 & 40 day respectively. The began the work together but A leaves after some days & B finished the remaining work in 23 days. After how many days did A leave?

A → 45 day B → 40 day

A & B → $\frac{1}{40} + \frac{1}{45} = \frac{17}{360}$ In day

work A & B did together $= \left(1 - \frac{23}{40}\right) = \frac{17}{40}$

1 day → $\frac{17}{360}$

$\frac{17}{360}$ In day → 1 day

$\frac{17}{40}$ → x ?

$\frac{17}{40} / \frac{17}{360} = \frac{360}{40} = 9$ day

Q If 4 men or 6 boys can finish a → 20 days, In how many days can 6 men & 11 boys finish it?

1 man → $\frac{1}{20 \times 4}$, 1 boy → $\frac{1}{20 \times 6}$

6 men & 11 boy → $\frac{6}{80} + \frac{11}{120} = \frac{18+22}{240} = \frac{40}{240} = \frac{1}{6}$ In day

6 men & 11 boy → 6 days

Time & distance

distance = speed × Time

Q student walk from house to school at 5 km/hr, he late by 30 min. If he walks at 6 km/hr that late by 5 mins what is the distance b/w house & school

Case - I
S = 5 Km/h
time = t

Case - II
S = 6 Km/h
time = $t - \frac{25}{60}$

$d_1 = d_2$

$5 \times t = 6 \times \left(t - \frac{25}{60}\right)$

$5t = 6t - 25$

$t - \frac{25}{10} = 2.5$

$d = 5 \times \frac{5}{2}$

$= \frac{25}{2}$

$= 12.5$ km

Q 5 tires in a sedan (four road tired & 1 spare) which in to be used equally in a journey to Travel 40000 km. The no of km of use of each tired use?

$$\frac{40000}{5} = 8000 \text{ km}$$

one tire use = 40000 - 8000 = 32000 km

Q Ram → 36 km → Partly 3 km/h & 4 km/h If he had walked at a speed of 3 km/h when he had walked at 4 & 4 km/h when he had walked at 3, he could have walked only 34 km, The time spent by Ram in walking was?

Case I
d = 36 km
t_1 = x (3 km/h)
t_2 = y (4 km/h)

$3x + 4y = 36$
$x = \frac{36-4y}{3}$

$x = \frac{36-24}{3}$

4 hours

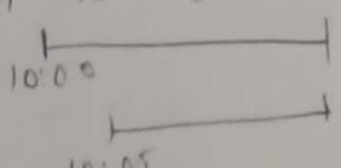
Case - II
d = 34 km
t_3 = x (3 km/h)
t_4 = y (4 km/h)

$3y + 4x = 34$
$3y + 4\left(\frac{36-4y}{3}\right) = 34$

$9y + (4 \times 36) - 16y = 34 \times 3$
$(4 \times 36) - (34 \times 3) = 7y$
$6(24 - 17) = 7y$
$y = 6$ hours

Time = x + y = 10 hours

Q old man take → 30 min & a young takes 20 min to apartment to office. If one day old man start at 10:00 am & the young man at 10:05 am. from the apartment to office, when will they meet?



old
d
t

young
d
t - 5

$S = \frac{x}{30}$ $S = \frac{x}{20}$

$d_1 = d_2$

$\frac{x}{30} \times t = \frac{x}{20} \times (t-5)$

$2t = 3t - 15$

$t = 15$ min

time $\rightarrow$ 10:15 Am

Boats & streams

Q upstream $\rightarrow$ 4 km/h downstream $\rightarrow$ 8 km/h find man's rate in still water & the rate of current

upstream

$u - v = 4$

downstream

$u + v = 8$

$2u = 12$

$u = 6$ km/m $\leftarrow$ man

v 2 km/m $\leftarrow$ current

Q rows 24 km downstream & 16 km upstream, taking 4 hours each time. find the velocity of the current.

Downstream

$d = 24$ km

$t = 4$ hours

$S_d = \frac{24}{4} = 6$

up stream

$d = 16$ km

$t = 4$ hours

$S_{up} = \frac{16}{4} = 4$

$u + v = 6$

$u - v = 4$

$2u = 10$

$2u = 5$

$v = 1$ $\leftarrow$ current

Q A man can row 4.5 km/h in still water & he find that it takes him twice ~~as~~ ~~it~~ long to row up as to row down the river find the rate of the stream

$S_{up} = \frac{1}{2} S_{dow}$

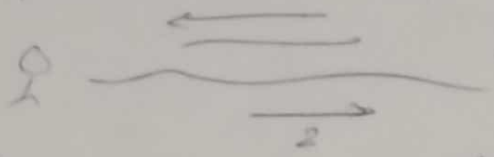
$u = 4.5$ km

$(u-v) = \frac{1}{2}(u+v)$

$2u - 2v = u + v$

$v = 3/3 = 4.5/3 = 1.5$ km

Q A man can row 8 km/h in still water. When the river is running at 2 km/h, it takes him 3 hours 12 min to row to a place & back. How far is the place?



Downstream

d

t_1

$u+v = 8+2$

$Sd = 10$ km/h

$d = 10t_1$

Upstream

d

t_2

$u-v = 8-2$

$Su = 6$ km/h

$d = 6t_2$

$10t_1 = 6t_2$

$5t_1 = 3t_2$

$t_1 = \frac{3t_2}{5}$

$t_1 + t_2 = 3\frac{12}{60} = 3+\frac{1}{5}$

$\frac{3t_2}{5} + t_2 = 3+\frac{1}{5}$

$\frac{8t_2}{5} = \frac{16}{5}$

$t_2 = 2$ hr

$t_1 = 6/5$

$\boxed{d = 6(2) = 12 \text{ km}}$

Q A man 30 km upstream & 44 km downstream in 10 h while he can 40 km upstream & 55 km downstream in 13 hours. Find the rate of current (v) & speed of man (u).

case - I

$\frac{30}{u-v} + \frac{44}{u+v} = 10$

$30p + 44q = 10$

case - II

$\frac{40}{u-v} + \frac{55}{u+v} = 13$

$40p + 55q = 13$

$p = 1/5$, $q = \frac{1}{11}$

$u-v = 5$ $\quad u+v = 11$

$u = 16/2 = 8$ km/h

$v = 3$ km/h

Ratio & Proportion

Q Divide Rs 420 among A & B & C in $\frac{1}{3} : \frac{5}{6} : \frac{7}{9}$

Ans LCA = 18

$\frac{18}{3} : \frac{5 \times 18}{6} : \frac{7 \times 18}{9} = 6 : 15 : 14$

$6x + 15x + 14x = 420$

$35x = 420$

$x = 12$

A & B & C = 72 : 180 : 168

Q boy & girl ratio 5 : 3 If 16% of boys & 20% girls are scholarship holder, find the Percentage of those who are not scholarship holder

→ b : g = 5 : 3

stud = 8x

B = $5x \times \frac{16}{100}$

g = $3x \times \frac{20}{100}$

Non-scholer

$8x - \frac{20x}{100}(4+3)$

Non-scholer %

$\frac{100 \times 8x - \frac{20x}{100} \times 7}{8x} \times 100$

$\frac{800x - 140x}{8x}$

$\frac{640x}{8x}$

80%

Q An employer reduce the no of emp in the ratio 7:8 and increase their wages in the ratio 14:15. In what ratio the wages bill is increased or decreased?

$14y \longrightarrow 15y$

$7x \longrightarrow 8x$

$7(x)\ 14(y) \longrightarrow 8(x)\ 15(y)$

$126\ xy \longrightarrow 120\ xy$

$21 : 20$ ← decreased

Problem on Age

Q ratio 3:2 of Kamal & Vimal After 5 years, the ratio of this age will be 4:3 Find the present age of each

$$\frac{K}{V} = \frac{3}{2} \qquad \frac{K+5}{V+5} = \frac{4}{3}$$

$$K = \frac{3}{2}V \qquad \frac{\frac{3}{2}V + 5}{V+5} = \frac{4}{3}$$

$$9V + 30 = 8V + 40$$

$$V = 10$$

$$K = 15$$

Q Sum of mend son is 100 years five years ago their ages were in the ratio 2:1, What will be the ratio of their ages after 10 years?

$$m + s = 100$$

$$\frac{m-5}{s-5} = \frac{2}{1}$$

$$\frac{100-s-5}{s-5} = 2$$

$$100 - s - 5 = 2s - 10$$

$$3s = 105$$

$$s = 35$$

$$m = 65$$

$$\frac{m+10}{s+10} = \frac{65+10}{35+10} \qquad \frac{75}{45} = \frac{5}{3}$$

Amit is as much younger to Deepak as he is older to Vikas. If the total of the ages of Deepak & Vikas is 52 years, how old is Amit?

→ $D - A = A - V$ $\qquad D + V = 52$

$52 = 2A$

$A = 26$

Kamla married 6 years ago. Today her age is $1\frac{1}{4}$ times her age at the time of marriage. Son age is $\frac{1}{10}$ time her age. what is the Present age of her son?

$K \qquad K - 6$

$K = 1\frac{1}{4}(K-6)$ $\qquad S = \frac{K}{10} = ?$

$= \frac{5}{4}(K-6)$ $\qquad S = 3$ years

$K = 30$

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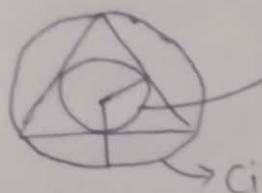
diagonal Area

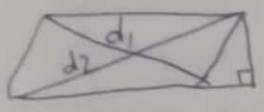
$\square \rightarrow a^2 = \frac{1}{2}(d^2)$ $\qquad \triangle = \frac{1}{2}(b \times h)$ $\qquad \frac{a+b+c}{2} = s$

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

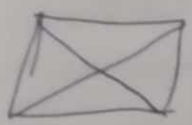


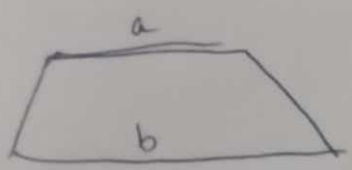
inscribed $\qquad r/in = \frac{a}{2\sqrt{3}}$ $\qquad R/ci = 2r/in = \frac{a}{\sqrt{3}}$

circumscribed



area = $b \times h = \frac{1}{2}(d_1 \times d_2)$





$\frac{1}{2}$ (sum of 11 side) $\times h$

$\frac{1}{2}(a+b) \times h$

Q If each side of a square is increased by 150%, find the increase percent in its area

$a \longrightarrow 2.5a$

$a^2 \longrightarrow 6.25a^2$

increase $= \frac{25}{4}a^2 - a^2 = \frac{21}{4}a^2$

% increase $= \frac{\text{incre}}{\text{actu}} \times 100$

$= \frac{\frac{21a^2}{4}}{a^2} \times 100$

$= \frac{21}{4} \times 100$

$= 525\%$

Q An arc of length 22 cm of a circle subtends an angle of 72° at the centre what is the radius of the circle?

$\frac{\theta}{360} \times 2\pi r = 22$

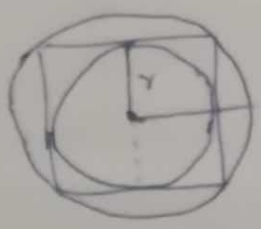
$\frac{72}{360} \times 2\pi r = 22$

$\frac{2\pi r}{5} = 22$

$\pi r = \frac{22 \times 5}{2}$

$r = \frac{22 \times 7 \times 5}{22 \times 2} = \frac{35}{2} = 17.5$

Q What is the ratio between the area of two circles which have respectively been inscribed in a square and circumscribed about the same square?



$r = \frac{a}{2}$ $\quad 2R = \text{dig. of side}$

$2R = a\sqrt{2}$

$R = \frac{a}{\sqrt{2}}$

$\frac{\pi r^2}{\pi R^2} = \frac{\left(\frac{a}{2}\right)^2}{\left(\frac{a}{\sqrt{2}}\right)^2} = \frac{2}{4} = \frac{1}{2}$

Permutation & Combination

select & arrage — only select

abc

$^3C_2$

ab
bc
ca

$^3P_2$

ab
ba
bc
cb
ac
ca

$^nC_r = \frac{n!}{(n-r)!\,r!}$ $\quad$ $^5C_2 = \frac{5\times4}{2\times1}$ $\quad$ $^6C_3 = \frac{6\times5\times4}{3\times2\times1}$

$^nP_r = \frac{n!}{(n-r)!}$

* WATCH (repeat not)

_ _ _ _ _ $= 5!$

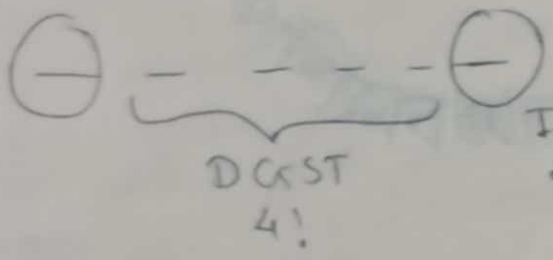
ENGINEERING

~~E N G I R~~ $= \frac{11!}{3!\,3!\,2!\,2!}$

E n g i

DIGEST (and वाले में multiply) (or वाले में sum)

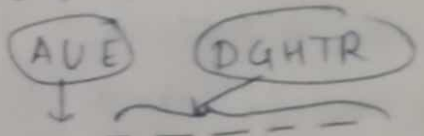
vocal & Arrage



chain method

DAUGHTER

Vocal at same place



$= 6!\times3!$

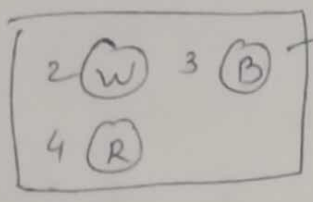
Vocal not at same place

$8! - 6!\times3!$

7 M, 5 L ⟶ 6

4 2

$^{7}C_4 \times {}^{5}C_2 = \frac{7\times6\times5}{3\times2\times1} \times \frac{5\times4}{2\times1}$ =



→ select 3 ball & 1 black

1	2	3
$^{3}C_1 \times {}^{6}C_2$	$^{3}C_2 \times {}^{6}C_1$	$^{3}C_3$

+ +

Q ⇒ In an Exam there are multiple choice que and ech question has 4 choices. The no. of way in which a student can fail to get all answer correct is!

Q_1	Q_2	Q_3
a	a	a
b	b	b
c	c	c
d	d	d

(ans) $^{4}C_1 \times {}^{4}C_1 \times {}^{4}C_1$ - right $^{1}C_1 \times {}^{1}C_1 \times {}^{1}C_1$

64 - 1

= 63

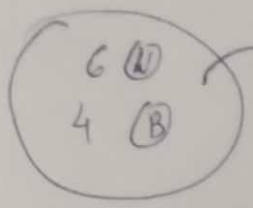
Q ⇒ 5 member Comittee, 3 trainees, 4 prof & 6 researcher In how many different way we should have 4 professor & 1 research or all 3 trainees & 2 professer

$$\left({}^{4}C_4 \times {}^{6}C_1\right) + \left({}^{3}C_3 \times {}^{4}C_2\right)$$

Probability

AND ⟶ ×
OR ⟶ +

Q A bag contains 6 white & 4 black ball, two ball are random choice. find probability that they are same colour.



$$\frac{{}^6C_2 + {}^4C_2}{{}^{10}C_2} =$$

total
${}^{10}C_2$

Q Two dice are thrown what in the probability that the sum of the no. on the two faces is divisible by 4 or 6?

2 ——— 12
4, 6, 8, 12

1,3	2,2	3,1	4,2	5,1	6,2
1,5	2,4	3,3	4,4	5,3	6,6
	2,6	3,5			

total
${}^6C_1 \times {}^6C_1$

$$= \frac{14}{36}$$

Q Two cards are drawn at random from a pack of 52 cards. what is the probability that either both are black or both are queen?

$$\frac{{}^{26}C_2 + {}^4C_2 - {}^2C_2}{{}^{52}C_2}$$

two queen from black

total
${}^{52}C_2$

Q A man & wife appear for interview for 2 vacancies. The probability of man selection is 1/7 & wife is 1/5. what is probability only one of them is selected?

$m = 1/7 \quad \bar{m} = 6/7$
$w = 1/5 \quad \bar{w} = 4/5$

$$= \left(\frac{1}{7} \times \frac{4}{5}\right) + \left(\frac{1}{5} \times \frac{6}{7}\right)$$

Q A speaks truth in 75% case & B — 80%. In what percen of cases are they ~~are~~ likely to contradict each other, in narrating the same incident?

$P(A^T) = 75/100 = 3/4$, $P(B^T) = 80/100$

$(A^F \& B^T) + (A^T \& B^F)$

$= \left(\frac{25}{100} \times \frac{80}{100}\right) + \left(\frac{75}{100} \times \frac{20}{100}\right)$

$= 35\%$.

Q 15 boys, 10 girls

3 students are selected at random

P (2 boys, 1 girl in selected) = ?

total : $^{25}C_3$

$$\frac{^{15}C_2 \times {}^{10}C_1}{^{25}C_3}$$

Principal Rate Simple Interest

Ans $SI = \frac{P \times R \times T}{100}$ ← Time (Year)

Q find SI on Rs. 1600 at 6% p.a for 146 days

$$SI = \frac{1600 \times 6 \times \frac{146}{365}}{100} = 38.40$$

Q sum at 9% p.a. SI accounts to Rs 2921 in 3 years. And the sum.

$P + SI = 2921$

$P + \frac{P \times 9 \times 3}{100} = 2921$

$127P = 292100$

$P = 2300$

Q A certain sum of money Rs 854 in 2 years and Rs 959.50 in 3½ years find rate of Interest

$P + SI_2 = 854$

$P + SI_{3.5} = 969.5$

1.5 year = 969.5 − 854 = 115.5

$\frac{P \times R \times 3}{100 \times 2} = 115.5$

$P \times R = \frac{11550 \times 2}{5}$

$PR = 7700$

$P + \frac{P \times R \times 2}{100} = 854$

$P + \frac{7700 \times 2}{100} = 854$

$P + 154 = 854$

$P = 700$

$R = \frac{7770}{700} = 11\%$

Q At what rate percent per annum at SI will a sum of money double in 8 years?

$SI = P$

$\frac{P \times R \times T}{100} = P$

$R = \frac{100}{8} = \frac{50}{4} = 12.5\%$

Q Sum of 8000 was lent partly at 8% & partly at 10%. Per an SI. If the total a. interest be Rs 714, find the Sum lent at 8%.

$x \rightarrow 8\%$

$\frac{x \times 8 \times 1}{100} + \frac{(8000 - x) \times 10 \times 1}{100} = 714$

$x = 4300$

Compound Interest

$$\text{Amount} = P\left(1+\frac{R}{100}\right)^{n} \leftarrow \text{years}$$

$$= P\left(1+\frac{R1}{100}\right)\left(1+\frac{R2}{100}\right)\left(1+\frac{R3}{100}\right)$$

Half Yearly - Compounding

$$\text{Amount} = P\left(1+\frac{R}{2\times 100}\right)^{4} \leftarrow 2 \text{ years}$$

3.5 year

Quarterly

$$\text{Amount} = P\left(1+\frac{R}{4\times 100}\right)^{14}$$

Annually 3 year 3 month

$$\text{Amount} = P\left(1+\frac{R}{100}\right)^{3}\left(1+\frac{3R}{12\times 100}\right)^{1}$$

Q find C.I on Rs 18750 at 8% p.a for 2 year 5 month

$$\text{Amount} = P\left(1+\frac{R}{100}\right)^{2}\left(1+\frac{5}{12}\frac{R}{100}\right)$$

$$= 18750\left(1+\frac{8}{100}\right)^{2}\left(1+\frac{5}{12}\times\frac{8}{100}\right)$$

$$= 22599$$

$$CI = 22599 - 14750$$

Q Find Compound I. on Rs 5000 for 3 years, the rate of interest being 5% during 1st year, 8% during 2nd year and 10% during 3rd year

$$\text{Amount} = 5000\left(1+\frac{5}{100}\right)\left(1+\frac{8}{100}\right)\left(1+\frac{10}{100}\right)$$

$$= 6237$$

$$CI = 6237 - 5000$$

$$= 1237$$

Q find CI on RS 25600 at 12% pe. an for 1 years, compoed half yearly

$$A = 25000\left(1 + \frac{1}{2}\frac{12}{100}\right)^2$$

$$= 25000\left(1 + \frac{6}{100}\right)^2$$

$$= 25090$$

$$CI = 28090 - 250000 = 3090$$

Q A sum on CI amount to RS 30250 in 2 years and 33275 in 3 years. find the sum & rate percent P.a.

$$\frac{30250}{33275} = \frac{P\left(1 + \frac{R}{100}\right)^2}{P\left(1 + \frac{R}{100}\right)^3}$$

$$1 + \frac{R}{100} = \frac{33275}{30250}$$

$$R = 10\%$$

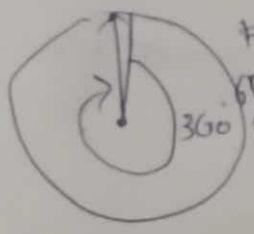
$$30250 = P\left(1 + \frac{10}{100}\right)^2$$

$$30250 = P\left(\frac{11}{10}\right)^2$$

$$P = \frac{30250 \times 100}{121} = 25000$$

Clock

min hand



60 min = 360°

1 min = 6°

hour hand

60 min = 30°

1 min = ½°

In One hour (360°)

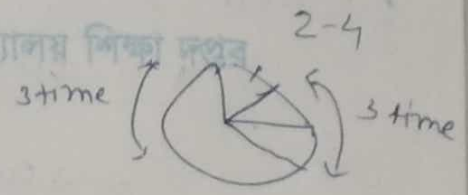
min hand moves = 60 mins

hour hand moves = 5 min

} In 60 min 55 min over than hour hand

No. of times h and b concide

1. In every hour = 1 times
2. In 12 hours = 11 times
3. In 24 hours = 22 times
4. In 12 hours (90° degree angel) = 2 times
   In 12 hours = 22 times
   In 24 hours = 44 times

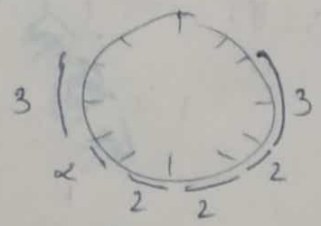


* Mirror Image

$$\begin{array}{r} 11:59 \\ -\ 4:30 \\ \hline 7:30 \end{array} \qquad \begin{array}{r} 11:59 \\ -\ 5:17 \\ \hline 6:43 \end{array}$$

Q B/ω 2'0 to 10'0, how many time the hands of a clock are at right angle?

→ 14 times



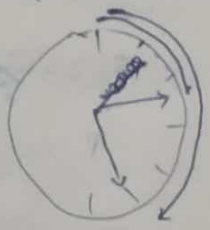
Q Find the angle between the hours hand & the minute hand of a clock when time is 2:25?

1 min $\frac{1}{2}^\circ$

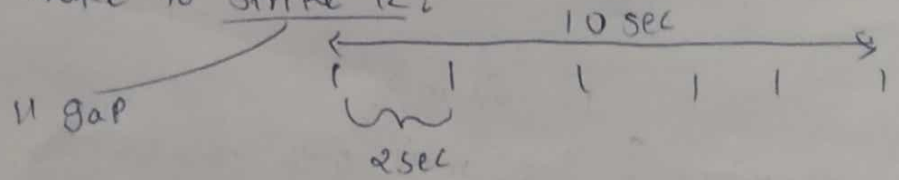
25 min $\frac{1}{2} \times 25^\circ$

$= 150^\circ - (60^\circ + 25\frac{1}{2}^\circ)$

$= 77\frac{1}{2}^\circ$



Q A wall clock takes 10 sec to strik 6. How much time it will take to strike 12?

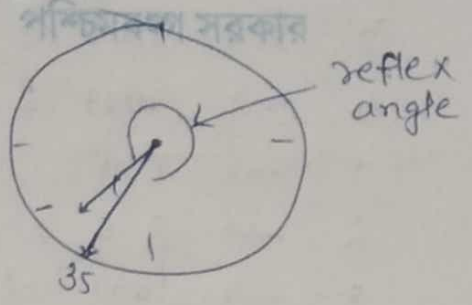


$11 \times 2 \text{ sec} = 22 \text{ sec}$

Q find the angle b/w the hour hand & the mi. hand of a clock when the time is 25 minutes to 8

1 min = $\frac{1}{2}^\circ$

35 min = $\frac{35}{2}^\circ = 17\frac{1}{2}^\circ$



Q The reflex angle between the hands of the clock at 10:25

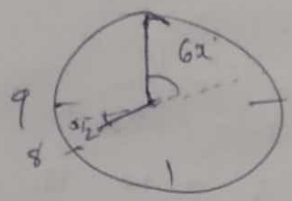
Q find the time b/w 8 & 9 clock when the hands of clock be in the same straigh line but not together

$10\frac{9}{11}$ min past 8

$10\frac{10}{11}$ min past 8

$10\frac{10}{11}$ min past 8

none



180° after x min

1 min min hand = 6x'

hour hand = $\frac{x^\circ}{2}$

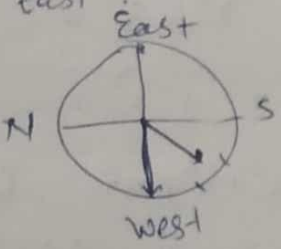
$120^\circ - \frac{x^\circ}{2} + 6x^\circ = 180$

$11x^\circ = 120$

$x^\circ = \frac{120}{11}$

$x = 10\frac{10}{11}$ min

Q At 12'o clock, the mi. hand is pointing East. At 4:30 in which direction will the hour hand point



South-west

Number System

3 → Sum of Numbe divisible by 3
79231 → 22 → no

4 → last 2 digit divisible by 4

5 → 0, 5

6 → 2 & 3 multiple

8 → last 3 digit divisible by 8

9 → sum of all No. divisible by 9

11 → 9 2 1 3 5 → 15 5 → if number difference is 0 or divisible by 11 then

12 → 3 & 4 divisible the 12 divisible

Q what least value must be given to * so that the no. 78*3945 is divisible by 11?

78*3945

(21+x) - 15

6+x = 0 || 6+x = 11

x = -6 (x) || x = 5

Prime Number (2, 3, 5, 7, 11, 13 ....)

36 → then we check 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12

where we should stop

$\sqrt{36} = 6$ (then 1, 2, 3, 4, 5, 6 are check)

Series

$1 + 2 + 3 + \dots + n = \frac{1}{2} n(n+1)$

$1^2 + 2^2 + 3^2 + \dots + n^2 = \frac{1}{6} n(n+1)(2n+1)$

$1^3 + 2^3 + 3^3 + \dots + n^3 = \frac{1}{4} n^2 (n+1)^2$

$(a+b)^2 = a^2+b^2+2ab$, $(a-b)^2 = (a^2+b^2-2ab)$, $(a+b)^2 - (a-b)^2 = 4ab$

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

$(a+b+c)^2 = a^2+b^2+c^2+2(ab+bc+ca)$, $(a^3+b^3+c^3-3abc) = (a+b+c)(a^2+b^2+c^2-ab-bc-ca)$

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

unit no. repeat after how many square

like 3 (3)

3^1	-3	3
3^2	-9	9
3^3	-27	7
3^4	-81	1
3^5	-243	3

4 no.

(4)	(5)	(6)	(7)	(8)	(9)	(2)
4	5	6	7	8	9	2
6	5	6	9	4	1	4
4	5	6	3	2	9	8
6	5		1	6	1	6
			7	8	1	2

Geometry

for Polygon diagonal vertix

$^{n}C_{2} - (n)$ ← side

Int Angle

$2(n-2)90^\circ$

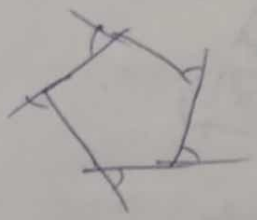
↑ side

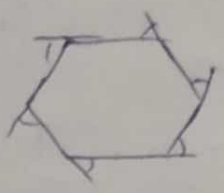
△ ↷ $2(1)90^\circ = 180^\circ$

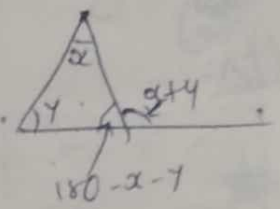
□ $2(2)90^\circ = 360^\circ$

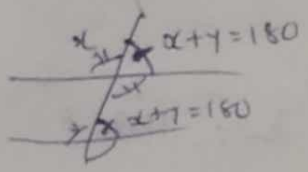
Ext Angle Sum

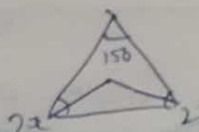
$= 360$











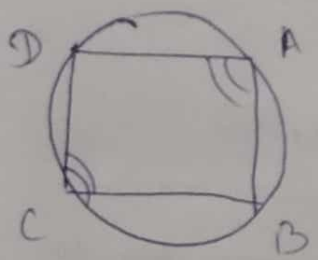
$2x + 2y + 150 = 180$

$x + y = 15$

$x + y + \theta = 180$

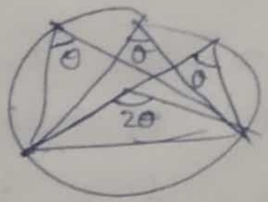
$15 + \theta = 180$

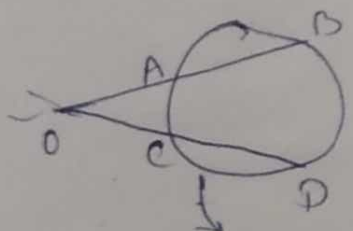
$\theta = 165$



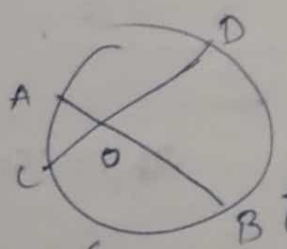
Cyclic $\angle A + C = 180$

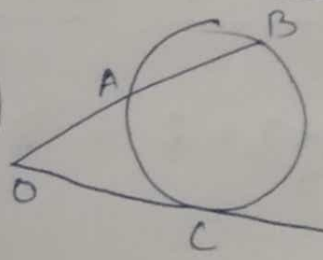
$\angle B + D = 180$





$OA \times OB = OC \times OD$





from there $OC^2 = OA \times OB$

Calendar

leap ⟶ 366 check 4 divisible
if it isn't centuary
like 1500 ✗

100 years ⟶ 24 leap year 1600 ⟶ 400 divisible

1 odd Year = 365 = 52 week (+1 day)

100 years = 76 odd + 24 leap
= $\overline{7|76} \times 1 + \overline{7|24} \times 2$ = odd days
= 6 + 6 =
$\overline{7|12}$
= 5 odd days

		Centuary end day
5	100 years	friday
3	200 years	wenday
1	300 years	mond
0	400 years	sun

200 years = $5 \times 2 = \overline{7|10} = 3$
300 years = $15 \times 3 = \overline{7|15} = 1$
400 years = $5 \times 4 + (1) = \overline{7|21} = 0$
leap

0	1	2	3	4	5	6
Sun	Mon	Tus	wed	Thr	fri	Sat

Q What was the day of the week on 16th July, 1776?

1600 year = 0
100 year = 5
75 years = $4\overline{|75}$ (3) = $\underbrace{18 \times 2}_{\text{leap year odd day}} + 57 \times 1 = \overline{7|36} + \overline{7|57} = 1 + 1 = 2$

Jan	feb	Mch	A	May	Jun	July
31	29	31	30	31	30	$\overline{7\|16}$
3	1	3	2	3	2	2 — odd day
		7		7		②

0 + 5 + 2 + 2 = 2 Tuesday
7

Q what is day of the week on 26th October, 2000?

2000 = 0

8 years = 2 leap + 6 ord

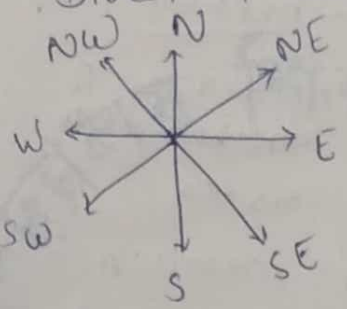
= 4 + 6 = 10 = 3

Jan	fe								
31	28	31	30	31	30	31	31	30	26
3	0	3	2	3	2	3	3	2	5

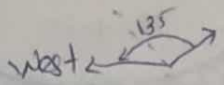
7) 12 = 5

0 + 3 + 5 = 8 = 1 Monday

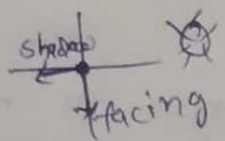
Direction Sense

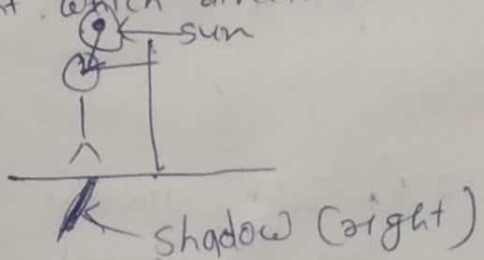


Q A man is facing N-W. He turns 90° in the clockwise dir. and then 135° in the ant-clockwise direction. which direction is he facing now?



Q One morning after Sun rise, gopal was standing facing a pole. The shadow of the pole exactly to his right. which direction was he facing?



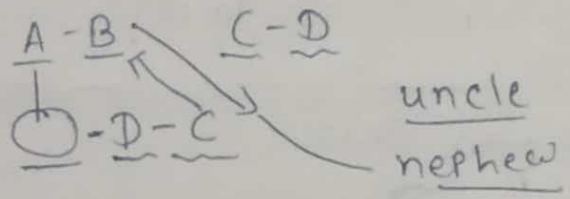


Blood Relation

A — male
B — female
A - B — sibling
AB — Hus/wife
A D
|
B - C
Parent

Niece - (Female) - ভাইঝি
Nephew - (Male) - ভাতিজা

Q A & B are brothers. C & D are sister, A's son is D's brother. How is B related to C?



Q A+B means 'A is the brother of B',
A-B " A " " mother " B
A×B " A " " sister " B'
Which of the following means A is maternal Uncle of B?

a) A+B+C
A-B-C

b) A-B+C
×

c) A+C-B
A - C
|
B

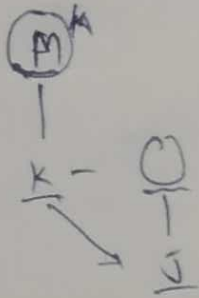
d) A+C×B
A - C - B

Q Pointing to photograph, a men tells him friend, "she is the daughter of the only son of my father's wife."

girl is daughter

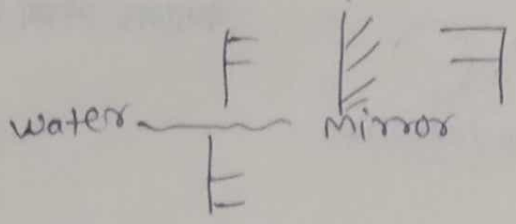
MF
|
Man
|
G

Q Kamal says "John's mother is the only daught of my mother" How is kamal related to John?

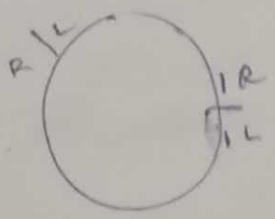


Uncle

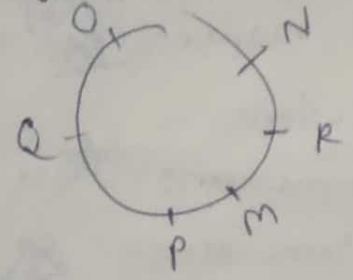
Water & Mirror Image



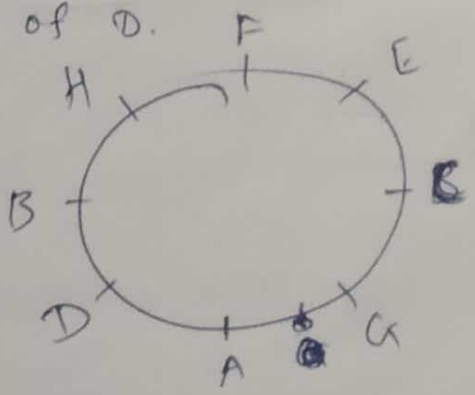
sitting Arrangement



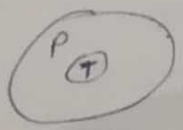
Q Six person M, N, O, P, Q & R are playing cards sitting in a circle facing the centre. R is sitting between M and N & Q is sitting between O & P. P is sitting at immediate right of M.



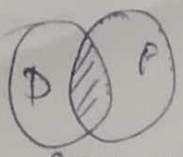
Q A, B, C, D, E, F, G, H are sitting around circular table facing the centre. F is fourth to the left of A & second to the right of C. B is second to the left of A & A is to the immediate right of G. E, who is not immediate neighbour of B is fourth to the left of D.



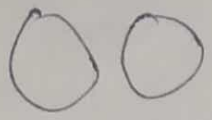
Venn Diagram



whole Part



Common



no common

Syllogism

Statement (Universal Truth)

Conclusions

I.

II.

Q Statement

All huts are mensions

All mansions are temples.

Conclusions

I. Some temples are huts

II. Some temples are mansions

Give answers

i) if only Co. I follows

ii) only Co. II follows

iii) either I or II follows

iv) neither I nor II follows

v) both Con. I & II follows