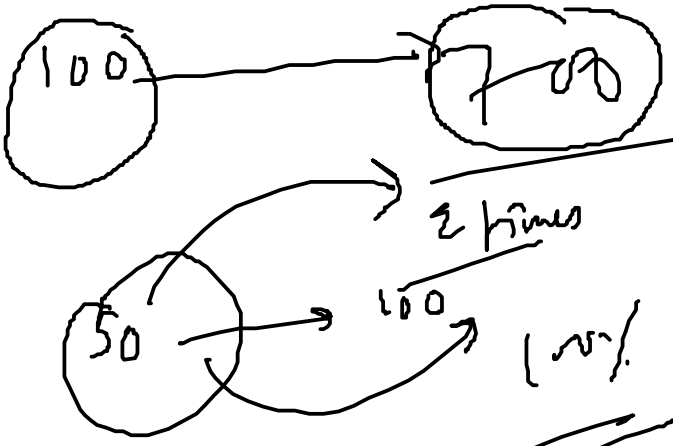
Arithmatic Session

Percentage Trick analysis



100 → 700 ✗ 600%

2 times 7 times

50 → 100 100%

400% → 5 times

800% → 9 times

% change → (+1)

Rs → 1 day 1
Rs → 2 day 2
Rs → 4 day 3
Rs → 8 day 4
Rs → 16 day 5

each day 100% increase in value..

10th day value??
15th " " "

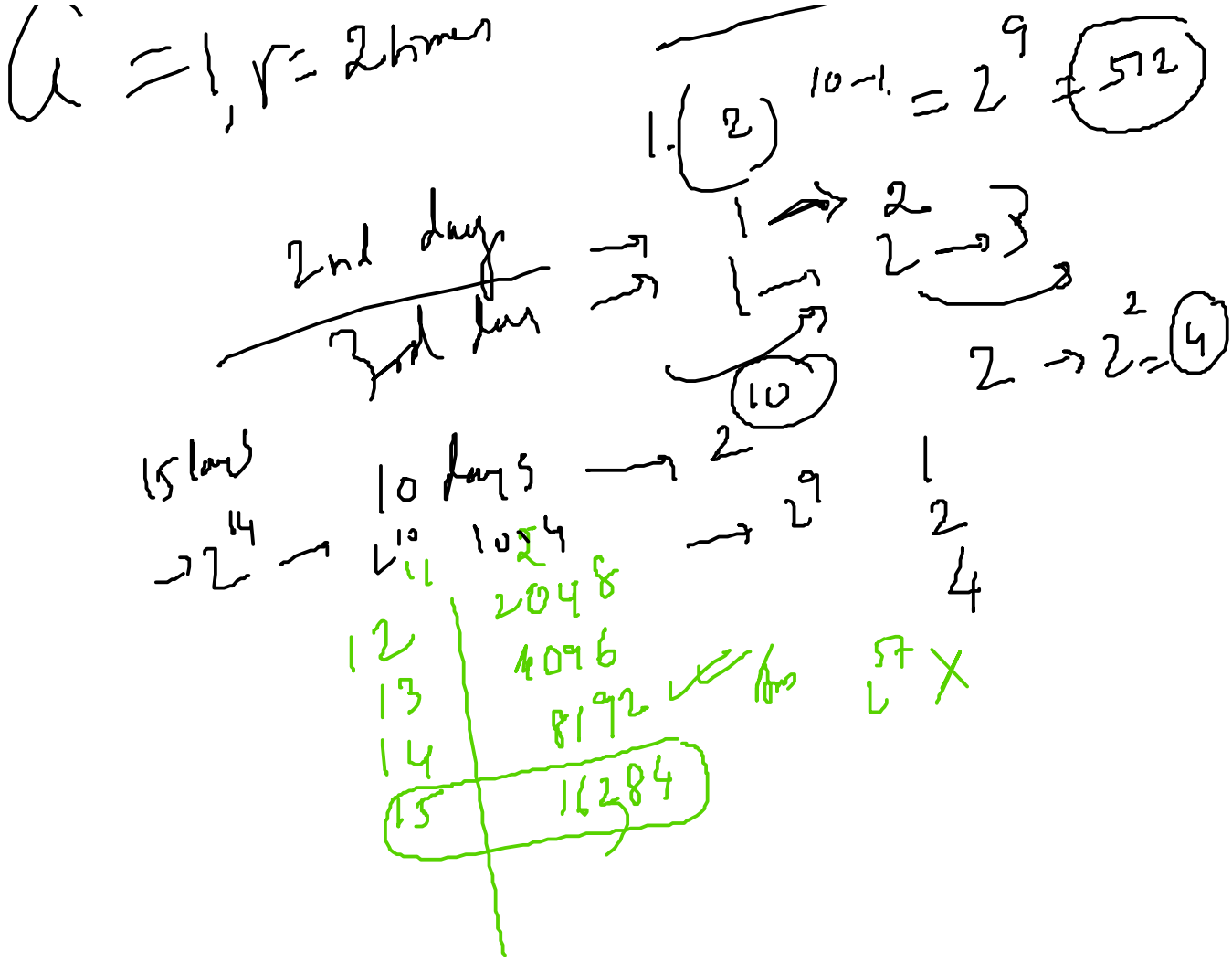
Each day 2 times.

ar^{n-1} → a = first value
r = Ratio
n = Total days

n = 10 days

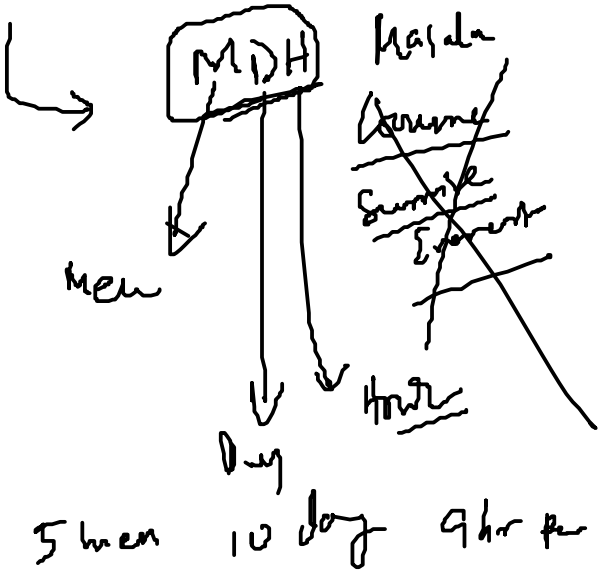
$a = 1, r = 2$ times

$1.(2)^{10-1} = 2^9 = 512$



change of values overall

time men Hour efficiency Problems



5 men 10 day 9hr per

$M_1D_1H_1 = M_2D_2H_2$ 8 men 7 days 10 hr

$= D_2$

$5 \cdot 10 \cdot 9 = 8 \cdot D_2 \cdot 10$

$\frac{5 \cdot \cancel{10} \cdot 9}{8 \cdot \cancel{10}} = \frac{45}{8} = 5.6$ days needed..

Q 40 people 7 days 10 hr/day 1/3 rd full

20 people 10 days ?

Q $\boxed{\frac{M_1D_1H_1}{W_1} = \frac{M_2D_2H_2}{W_2}}$

A+B working together..

A → Some work B → Rest of the work.

A can do in x days → Together $\cancel{(x+y)}$ days ??

B can do in y days → $\left(\frac{xy}{x+y}\right)$ days

5 7

$\frac{5 \cdot 7}{5+7} \rightarrow \frac{35}{12}$ $\cancel{\frac{x+y}{xy}}$

A+B → x days

A alone → y days

B alone → $\left(\frac{xy}{y-x}\right)$ Imp formula..

A → x, B → y, C → z } full work in how many days??

$\frac{xyz}{(xy+yz+zx)}$

$x_1x_2x_3x_4$

$(xy+yz+zx)$

A, B, C, D

x_1, x_2, x_3, x_4 days

$$\frac{x_1x_2x_3x_4}{(x_1x_2x_3+x_1x_2x_4+x_3x_4x_1+x_3x_4x_2)}$$

A+B → x days
B+C → y days
C+A → z days

A+B+C → $\left(\frac{2xyz}{xy+yz+zx}\right)$ → less than x, y, z ..

Can finish the work in days..

Structure

Southern Day 1 theory

A → ~~[illegible]~~

A meets B
male female

men 7
female 10 ✓

High value → low efficiency..

B [illegible]

A → ✓ ✓ ✓ ✓

Here we can't judge efficiency properly can't rest to quality..

A $\boxed{100}$ 10
B $\boxed{100}$ 4 ✓

B Don't judge much respect to reality..

Wages → Salary..

A → 3 days
B → 10 days ✓

R → 60
Rah → 45
Fam → 30

(B) → 1 day 5 hr

60 : 45 : 30

30 | 60, 45, 30
2, 45, 1

Wages Ratio → $\frac{1}{60} : \frac{1}{45} : \frac{1}{30}$

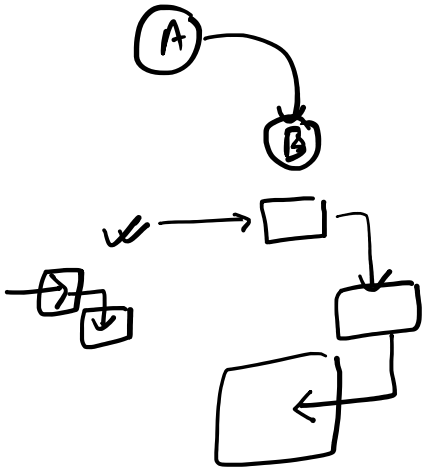
$\frac{2700}{60} : \frac{2700}{45} : \frac{2700}{30}$

→ 45 : 60 : 90

→ 3 : 4 : 6

Tank filling ::

h_1 10 hr > h_2 2nd 6 hr



$h_1 < h_2 < h_3 < h_4$

h_1 is the most efficient ..

Both Pipe together → $\frac{h_1 h_2}{h_1 + h_2}$

h_1 in

h_2 → out

→ $\frac{h_1 h_2}{h_1 - h_2}$ total time needed for filling ..

$$\frac{M_1 D_1 H_1}{W_1} = \frac{M_2 D_2 H_2}{W_2}$$

A pipe can fill → 12 hr.
Leakage in the bottom for that reason → 24 hr.
If for the full tank the in-pipe is stopped
then how long it will take to empty it?

$$\frac{12 \times 24}{24-12} = \frac{\cancel{12} \cdot 24}{\cancel{12}} = 24\text{hr}$$

#

A+B → 4 days.

A+B → $\left(\frac{1}{15} + \frac{1}{20}\right) = \frac{7}{60}$

Done 4 days → $\frac{4 \times 7}{60} = \frac{7}{15}$

$(1 - 7/15) = 8/15$

A+B+C = $\frac{1}{4}$

C in 1 day

A → $\frac{1}{16}$

B → $\frac{1}{12}$

$\frac{1}{4} - \frac{1}{16} - \frac{1}{12}$

$= \frac{5}{48}$

C can do → 5/48 → 48/5 → $9\frac{3}{5}$

1.
A can do a work in 15 days and B in 20 days. If they work on it together for 4 days, then the fraction of the work that is left is :
~~1/4~~
~~1/10~~
~~7/15~~
~~8/15~~

4 > 2

0.15 0.50 left

$\frac{1}{4}$ < $\frac{1}{2}$

2.
A can lay railway track between two given stations in 16 days and B can do the same job in 12 days. With help of C, they did the job in 4 days only. Then, C alone can do the job in:
9 1 days $9\frac{1}{15}$
5
9 2 days $9\frac{2}{15}$
5
9 3 days $9\frac{3}{5}$
5
10 10

3.
A, B and C can do a piece of work in 20, 30 and 60 days respectively. In how many days can A do the work if he is assisted by B and C on every third day?
~~12 days~~
~~15 days~~
16 days
18 days

A → 1 → $\frac{1}{20}$

A → 2 → 2/20 = $\frac{1}{10}$ done

4.
A is thrice as good as workman as B and therefore is able to finish a job in 60 days less than B. Working together, they can do it in:
~~20 days~~
~~22 1 days~~ $22\frac{1}{2}$
2
25 days
30 days

A
B
C
D

left → $1 - \frac{1}{10} = 9/10$

A+B+C → $\frac{1}{20} + \frac{1}{30} + \frac{1}{60} = \frac{6}{60} = \frac{1}{10}$

3 days → $\frac{3}{10} + \frac{1}{10} = \frac{2}{10} = \frac{1}{5}$

5.
A alone can do a piece of work in 6 days and B alone in 8 days. A and B undertook to do it for Rs. 3200. With the help of C, they completed the work in 3 days. How much is to be paid to C?
Rs. 375
Rs. 400
Rs. 600
Rs. 800

$\frac{1}{5}$ work is done in 3 days

20% work → 3 days

40% → 6

60% → 9

4 A : B = 1 : 3 time

diff → (3-1) = 2 days

(4) A : B

diff → (3-1) = 2 days

B → 3 days A → 1 day

diff 2 days → B 3 days

diff 60 → B → $\frac{3}{2} \times 60$ = 90 days

If B → 90 days → A → 30 days

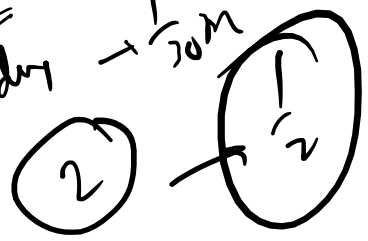
A → $\frac{1}{30}$ B → $\frac{1}{90}$

A+B

$\frac{1}{30} + \frac{1}{90} = \frac{4}{90} = \frac{2}{45}$

30 days work

1 day → $\frac{1}{30}$ M



1 day → $\frac{2}{45}$

full work → $\frac{45}{2}$ → $22\frac{1}{2}$ days