

Home Work Question - 1

Hema's age is 5 years more than twice Hari's age. Suresh's age is 13 year less than 10 times Hari's age. If Suresh is 3 times as old as Hema. How old is Hema?

[GATE 2018, 1 MARK (CE)]

A) 14

B) 17

C) 18

D) 19

Hari = x

$$H = 2x + 5$$

$$S = 10x - 13$$

$$S = 3H$$

$$3H = 10x - 13$$

$$x = \frac{H - 5}{2}$$

$$3H = 10\left(\frac{H - 5}{2}\right) - 13$$

$$3H = 5H - 25 - 13$$

$$2H = 38$$

$$H = 19$$



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Home Work Question - 2

The sum of the age of a father and his son is 100 years now. 5 years ago their age were in the ratio of 2 : 1. The ratio of the age of father and son after 10 years will be :

A) 5 : 3

B) 4 : 3

C) 10 : 7

D) 3 : 5

Handwritten solution:

Let the present ages of father and son be F and S respectively.

Given: $F + S = 100$ (1)

5 years ago, their ages were in the ratio 2 : 1.

Let 5 years ago, the ages were $2x$ and x .

So, $F - 5 = 2x$ and $S - 5 = x$.

Adding these two equations:

$$F - 5 + S - 5 = 2x + x$$

$$F + S - 10 = 3x$$

From equation (1), $F + S = 100$.

$$100 - 10 = 3x$$

$$90 = 3x$$

$$x = 30$$

So, 5 years ago, the father's age was $2x = 60$ and the son's age was $x = 30$.

Present ages: Father = 65, Son = 35.

After 10 years:

Father's age = $65 + 10 = 75$

Son's age = $35 + 10 = 45$

Ratio after 10 years = $75 : 45 = 5 : 3$.



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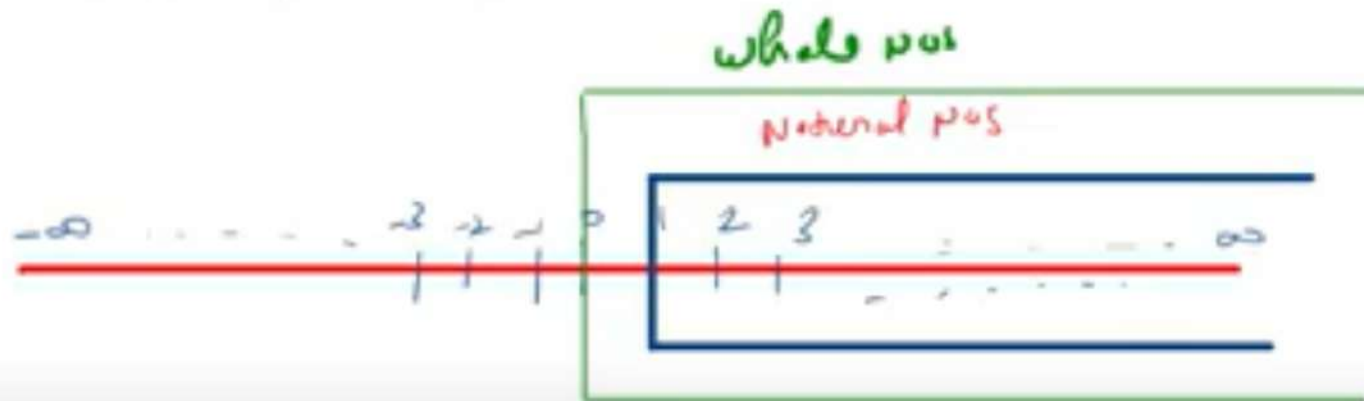
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Classification of Number

1) Natural & Whole number



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2) Real Number

Integers pos

-ve Integer

0

Non-negative Integer

+ve Integer

Decimal pos

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Decimal Number

Repeating
↕
Terminating
↓
Can be written in the form of $\frac{P}{Q}$
↓
Rational nos

eg $0.\overline{3333} \dots = 0.\overline{3}$
 $= \frac{3}{9} = \frac{1}{3}$

eg $0.6 = \frac{6}{10} = \left(\frac{3}{5}\right)$

eg $\frac{22}{7}$

Non-Repeating
↕
Non-terminating
↓
 $\neq \frac{P}{Q} \Rightarrow$ Irrational nos

eg $\sqrt{2} = 1.414213562$
 $\sqrt{3}, \pi = 3.141592 \dots$

~~$\frac{22}{7} \Rightarrow$ Approx~~

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$0.3333 \dots = 0.\overline{3}$

$$x = 0.33333 \dots$$

$$10x = 3.33333 \dots$$

$$9x = 3 \Rightarrow x = \frac{3}{9} = \frac{1}{3}$$

$$0.333 \dots = 0.\overline{3} = \frac{1}{3}$$

PSUS

$$0.\overline{52} = 0.525252 \dots = 0.\overline{52}$$

$$= \frac{52}{99}$$

$$0.\overline{630} = 0.630630 \dots = 0.\overline{630}$$

$$= \frac{630}{999}$$

Ques $0.725672567256 \dots$

$$\frac{P}{Q} = ?$$



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3) Even & Odd number

Even → divisible by 2

eg 2, 4, 6, 8, 10, 12, 14, ...

Standard form
= $2n$
Even Number

Odd → Not divisible by 2

eg 1, 3, 5, 7, 9, 11, ...

Standard form
→ $(2n+1)$ or $(2n-1)$



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NEHI HUI

4) Prime Number

↳ Exactly two factors (1, itself)
↳ Divisible by itself or 1

Note - Factors
eg 4 → 1, 2, 4
6 → 1, 2, 3, 6

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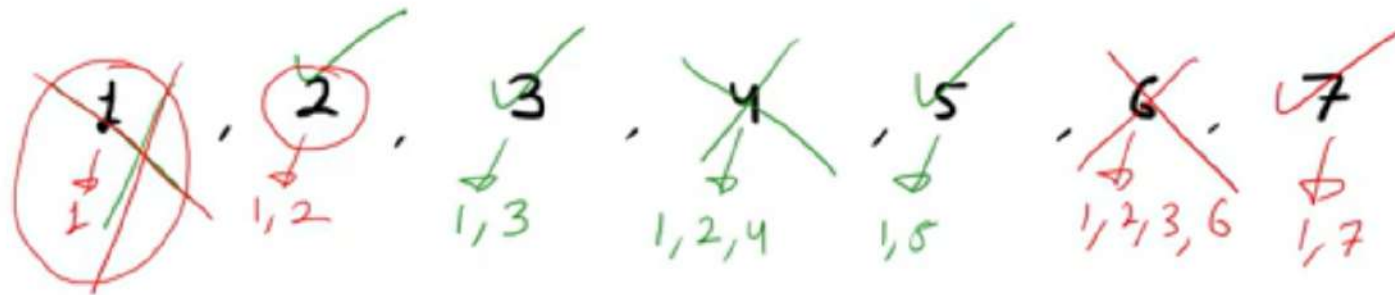
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A Alisha Salmani 7256/9999



→ 2 is only even prime number

→ 1 is not prime nos

→ $\left\{ \begin{array}{l} (1 \text{ to } \infty) \Rightarrow 2 \text{ s Prime No} \\ (1 \text{ to } 5) \Rightarrow 15 \\ (5 \text{ to } \infty) \Rightarrow 10 \end{array} \right\}$



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👤 Dhruve Manglik / by 2

👤 ...

*** Note- Any Prime number greater than 3 can be written in the form of $(6n+1)$ or $(6n-1)$ but not vice-versa

$$5 = \underline{6 \times 1 - 1}$$

$$7 = \underline{6 \times 1 + 1}$$

$$11 = \underline{6 \times 2 - 1}$$

$$13 = \underline{6 \times 2 + 1}$$



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Natural Number



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Shree Gaurav Kishore

Ankit kumar Yadav yes

5) Composite Number

↳ Any natural no having more than 2 distinct factors

eg

1 1	2 1, 2	3 1, 3	4 1, 2, 4	5 1, 5	6 1, 2, 3, 6	7 1, 7	...
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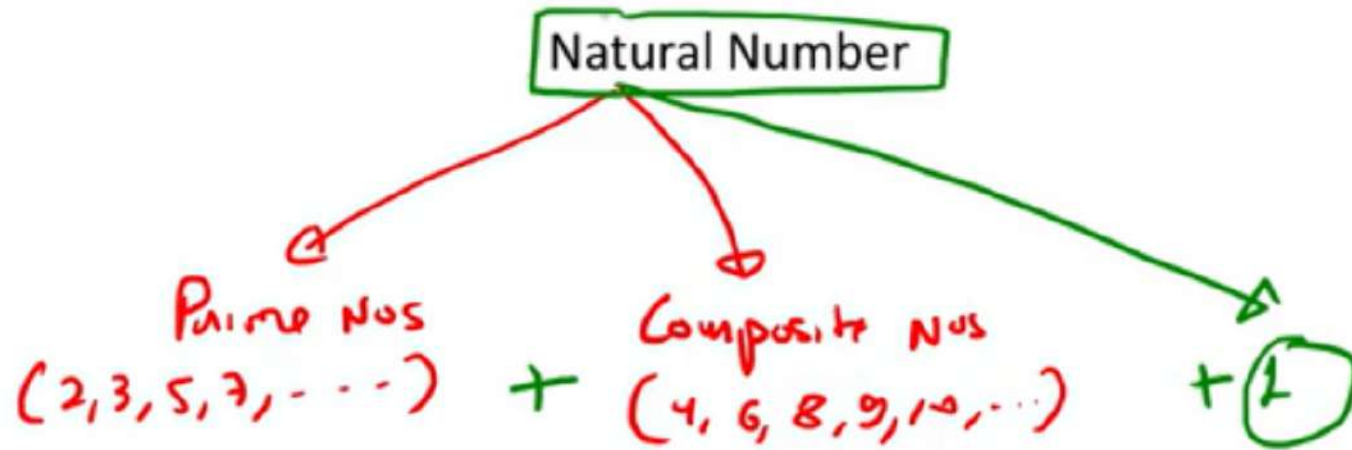
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Ankit kumar Yadav yes



5) Co-Prime Number

↳ Pair of prime nos with HCF 1

eg

$(2, 3)$, $(2, 4)$, $(2, 7)$

HCF

$(2, 3)$	$\Rightarrow 1$
$(2, 6)$	$\Rightarrow 2$
$(3, 9)$	$\Rightarrow 3$

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Prashant Bhaskar 2/0 infinite nhi hoga sir?



Aptitude for GATE/ESE/PSUs/AE/JE/College Placement, Topic- Ratio & Proportion

1) Find the sum of the first 20 terms of the series $2 \times 3, 4 \times 6, 6 \times 9, 8 \times 12, \dots$

A) 10710

B) 12654

C) 14880

☒ D) 17220

$$S_{20} = 2 \times 3 + 4 \times 6 + 6 \times 9 + 8 \times 12 + 10 \times 15 + \dots \text{20th term}$$

$$S_{20} = 6 [1 + 4 + 9 + 16 + 25 + \dots]$$

$$= 6 [1^2 + 2^2 + 3^2 + 4^2 + 5^2 + \dots] = 6 \sum n^2 \bigg|_{n=20}$$

$$= 6 \times \left[\frac{n(n+1)(2n+1)}{6} \right]_{n=20} = \frac{20 \times 21 \times 41}{1}$$



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Aptitude for GATE/ESE/PSUs/AE/JE/College Placement, Topic- ~~Number System~~

✓ 2) A man fills a basket with eggs in such a manner that the number of eggs added on each successive day is the same as the number already present in the basket. This way the basket gets completely filled in 24 days. After how many days the basket was $\frac{1}{4}$ th full?

(A) 6

(B) 12

(C) 17

✓ (D) 22

$$\begin{aligned} 24 &\rightarrow 100\% \\ 23 &\rightarrow 50\% \\ \underline{\underline{22}} &\rightarrow 25\% = \frac{1}{4} \end{aligned}$$



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