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Time Table

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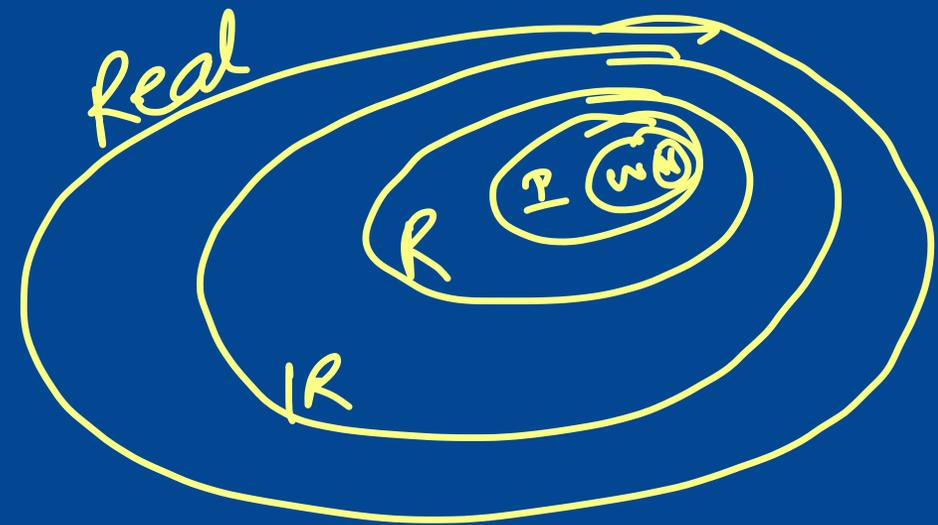FOR MAH-CET 2024 FOR BBA/BMS/BBM/BCA

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Number System

TYPES OF NUMBERS:

1. **Natural:** $1, 2, 3, \ldots \ldots \infty$

2. **Whole:** $0, 1, 2, 3, \ldots \ldots \infty$

3. **Integers:** $-\infty \ldots \ldots -3, -2, -1, 0, 1, 2, 3, \ldots \ldots \infty$

4. **Rational:** Decimal numbers $\longrightarrow$ TERMINATING & RECURRING

5. **Irrational:** NON-TERMINATING & NON-RECURRING

6. **Real:** Rational + Irrational.

Real

$\mathbb{R}$

$3.3333\ldots$

$3.414141\ldots$
$\approx 3.\overline{41}$

$3.14122173 \ldots \ldots$

Number System

SOME MORE TYPES OF NUMBERS:

1. **Even:** $N \div 2$ $R = 0$
2. **Odd:** $N \div 2$ $R = 1$
3. **Prime:** [2] 3, 5, 7, 11, 13, 17, ...
4. **Composite:** 4, 6, 8, 9,

3×3

$$2 = 1 \times 2$$

Special

EVEN PRIME NO.

Even $\dfrac{4}{2} = 2$

Odd $\dfrac{7}{2} = R = 1$

$N = N \times 1$

$3 = 3 \times 1$

② 4   6   8

Number System

Relative Prime Number

If two or more numbers have no common factor then they are called *relative prime or co-prime numbers.*

COMPOSITE

Example:

4 & 15

$$\text{COMPOSITE} \begin{bmatrix} 4 = 2 \times 2 \\ 15 = 3 \times 5 \end{bmatrix} \Bigg\} \text{ Relative Prime Nos.}$$

Few more things to remember:

Imp

1. **EVEN +/- EVEN = EVEN**
2. **ODD +/- ODD = EVEN**
3. ✓ **EVEN +/- ODD = ODD**

4. **EVEN x EVEN = EVEN**
5. **ODD x ODD = ODD**
6. ✓ **EVEN x ODD = EVEN**

$$4 + 2 = 6 \qquad 4 - 2 = 2$$
$$5 + 7 = 12 \qquad 5 - 7 = -2$$
$$4 + 3 = 7 \qquad 4 - 3 = 1$$

$$4 \times 2 = 8$$
$$3 \times 3 = 9 \qquad 3 \times 5 = 15$$
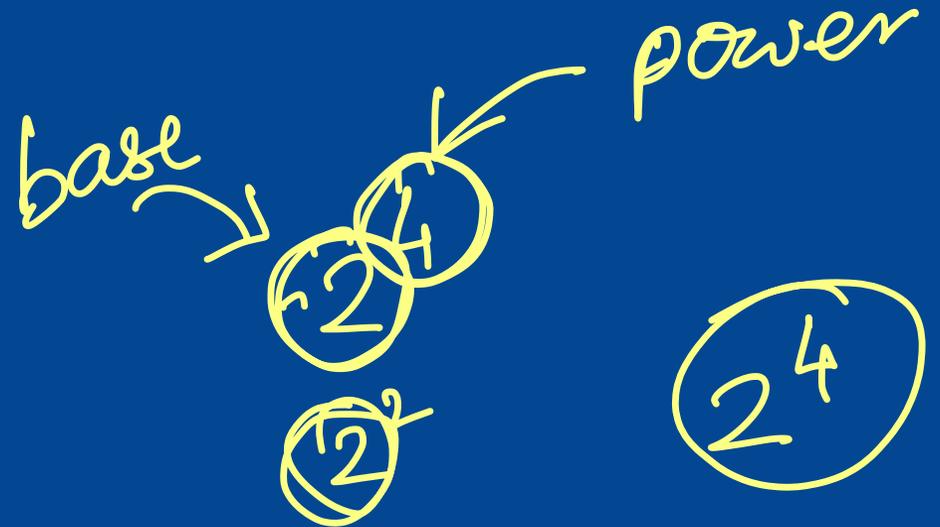$$4 \times 3 = 12 \qquad 7 \times 2 = 14$$

LCM

Least Common Multiple

How to find?

PRIME FACTORISATION

i. **Do factorization and represent repeated factors with powers**

ii. **For common factor base,**

   Choose the number with HIGHEST power

i. **Get the product of the number obtained in step (ii) and other unique factors**

base 2^4 power

2^4

Example: LCM of 10, 24

$\boxed{120}$

$10 = 2 \times 5$

① $24 = \boxed{2^3} \times 3$

② $LCM = 2^3 \times 5 \times 3$

$= 8 \times 5 \times 3$

$= 40 \times 3 = 120$

$$
\begin{array}{c|c}
2 & 10 \\
\hline
5 & 5 \\
\hline
 & 1
\end{array}
$$

$$
\begin{array}{c|c}
2 & 24 \\
\hline
2 & 12 \\
\hline
2 & 6 \\
\hline
3 & 3 \\
\hline
 & 1
\end{array}
$$

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Example: LCM of 3, 6, 9 $= \boxed{18}$

$3 = 3$

$6 = 2 \times 3$

$9 = 3 \times 3 = 3^2$

$$LCM = 3^2 \times 2$$
$$= 9 \times 2 = 18$$

TIPS for LCM: ①

1. LCM of number and its factor is number it self.

Example:

LCM of 3 and 27 → 3

→ 3^3

$$LCM = 27$$

$$\begin{array}{c|c} 3 & 27 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$27 = 3 \times 3 \times 3$$

TIPS for LCM: $①$

2. LCM of relative prime number is the product of both

Example:

LCM of 25 and 6 $= 25 \times 6 = 150$

$$25 = 5 \times 5$$
$$6 = 2 \times 3$$

$$LCM = 5 \times 5 \times 2 \times 3$$
$$= 25 \times 6$$
$$= 150$$

LCM of polynomials:

LCM of x² – 4 and x + 2

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

$$x^2 - 4 = x^2 - 2^2$$

$$= (x+2)(x-2)$$

$$(x+2) = (x+2)$$

$$LCM = (x+2)(x-2)$$

$$= x^2 - 4$$

HCF / GCD

Highest Common Factor / Greatest Common Divisor

How to find?

PRIME FACTORISATION

i. Do factorization and represent repeated factors with powers
ii. For common factor base,

Choose the number with LEAST power

Example: HCF of 4 and 6

$$4 = 2 \times 2 \rightarrow 2$$
$$6 = 2 \times 3$$

$$\boxed{HCF = 2}$$

Example: HCF of 12 and 16

$$12 = 2 \times 2 \times 3 \qquad = \boxed{2}^2 \times 3$$

$$16 = 2 \times 2 \times 2 \times 2 \qquad = \boxed{2}^4$$

$$\boxed{HCF = 2^2 = 4}$$

TIP FOR HCF

HCF of prime numbers or relative prime numbers is 1

Ex. HCF of 2 and 7

$2 \times 1 \qquad 7 \times 1$

$HCF = 1$

Ex. HCF of 9 and 14

$3 \times 3 \qquad 2 \times 7$

$HCF = 1$

HCF of polynomials

HCF of x² – 4 and x + 2

$$x^2 - 4 = (x + 2)(x - 2)$$

$$x + 2 = (x + 2)$$

$$\boxed{HCF = (x + 2)}$$

LCM of Fractions $= \dfrac{\textit{LCM of Numerators}}{\textit{HCF of Denominators}}$

LCM of $\dfrac{2}{3}$ **and** $\dfrac{5}{6}$

$$= \frac{2,5}{3,6} = \boxed{\frac{10}{3}}$$

$$3 = 3$$
$$6 = 3 \times 2$$

HCF of Fractions = $\dfrac{\textit{HCF of Numerators}}{\textit{LCM of Denominators}}$

HCF of $\dfrac{2}{3}$ **and** $\dfrac{5}{6}$

$$\dfrac{2\ ,\ 5}{3\ ,\ 6} = \boxed{\dfrac{1}{6}}$$

REMEMBER: Imp

For numbers a and b

[LCM of a,b] x (HCF of a,b) = a x b

$$LCM \times HCF = a \times b$$

①

$$LCM = \widehat{ab}$$

$(10x + y)$

$(xy) = \underline{41}$

1. A two digits number is obtained by either multiplying the sum of the digits by 8 and adding 1 or by multiplying the difference of digits by 13 and adding 2. The number is

(a) 63
(b) 31
(c) 23
(d) 41

(D)

$10x + y = 8(x+y) + 1$

$10x + y = 8x + 8y + 1$

$10x - 8x + y - 8y = 1$

$\boxed{2x - 7y = 1} \times 2$

$8 - 7y = 1$

$-7y = 1 - 8$

$-7y = -7$

$\boxed{y = 1}$

$4x - 14y = 2$
$\underline{- 3x + 14y = 2}$

x = (4)

$10x + y = 13(x - y) + 2$

$10x + y = 13x - 13y + 2$

$10x - 13x + y + 13y = 2$

$\boxed{-3x + 14y = 2}$

54 sec

2. The product of two numbers is $-\dfrac{14}{27}$. If one of the numbers be $\dfrac{7}{9}$, then the other number is

(a) $-\dfrac{3}{2}$

(b) $-\dfrac{2}{3}$

(c) $\dfrac{2}{3}$

(d) $\dfrac{3}{2}$

B

$$x \times \frac{7}{9} = \frac{-14}{27}$$

$$\frac{-14}{27 \times 3} \times \frac{9}{7} = -\frac{2}{3}$$

3.

The HCF of $2^3 \times 3^2 \times 5$, $2^2 \times 3^3 \times 5^2$ and $2^4 \times 3 \times 5^3 \times 7$ is

(a) 30

(b) 48

(c) 60

(d) 105

C

$2^3 \times 3^2 \times 5$

$2^2 \times 3^3 \times 5^2$

$2^4 \times 3 \times 5^3 \times 7$

$HCF = 2^2 \times 3^1 \times 5$

$= 4 \times 3 \times 5$

$= 60$

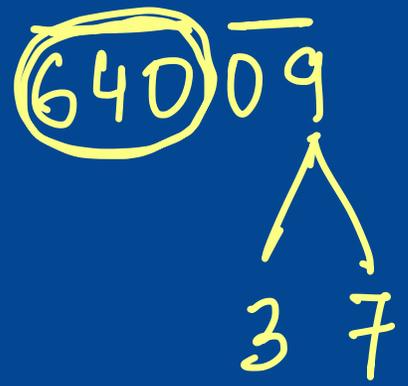**4. The square root of 64009 is:**

A. 253
B. 347
C. 363
D. 803

$\overline{640}\ \overline{09}$

3 7

$25^2 = 625$; 15
$\boxed{640}$; 36
$26^2 = 676$

$\boxed{253}$

1
2
3 — 9
4
5
6
7 — 3

Ⓐ

Dividend = Divisor × Quotient + Remainder

5. In a division sum, the divisor is 10 times the quotient and 5 times the remainder. If the remainder is 46, the dividend is:
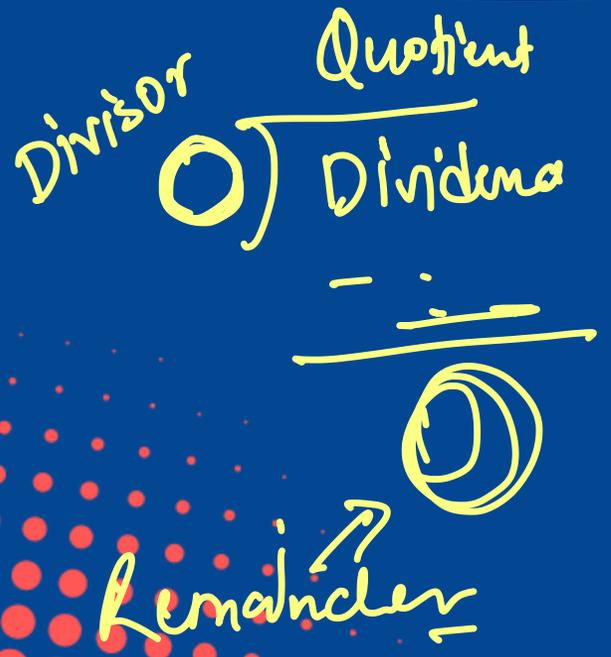
A. 4236

B. 4306

C. 4336

D. 5336

$Q \qquad R$

$\text{Divisor} = 10Q = 5R$

$10Q = 5(46)$

$Q = \dfrac{230}{10}$

$Q = 23$

$D = 230$

$R = 46$

Divisor — Quotient

$O \overline{)\ \text{Dividend}}$

Remainder

$D = 230 \times 23 + 46$

$= 5290 + 46$

$= 5336$

$$xy \longrightarrow 10x+y = 3(x+y) \qquad yx = 10y+x$$

6. A certain number of two digits is three times the sum of its digits. If 45 be added to it, the digits are reversed. The number is:

A. 72

B. 32

C. 27

D. 23

$$10x + y + 45 = 10y + x$$

HW

x

y

7. The cost of 2 chairs and 3 tables is Rs.1300. The cost of 3 chairs and 2 tables is Rs.1200. The cost of each table is more than that of each chair by?

A. Rs. 70

B. Rs. 50

C. Rs. 75

D. None of these

$$2x + 3y = 1300$$
$$3x + 2y = 1200$$

HW

8. If 40% of a number is 256, then what is 25% of that number ?

A. 260
B. 160
C. 150
D. 210

$\boxed{B}$

$$\frac{40}{100} \times \boxed{x} = 256$$

$$40\% \longrightarrow 256$$

$$10\% \longrightarrow \frac{256}{4} = 64$$

$$5\% \longrightarrow 32$$

$$2(10\%) + 5\%$$

$$2 \times 64 + 32$$

$$128 + 32 = \boxed{160}$$

9. Which is the largest? 1⁄4, 2/5, 2/7 or 0.3?
A. 1⁄4
B. 2/5
C. 2/7
D. 0.3

$$\frac{1}{4} \qquad \frac{2}{5} \qquad \frac{2}{7} \qquad 0.3$$

$$0.25 \quad \boxed{0.4} \quad 0.28 \quad 0.3$$

$$\frac{1}{2} \,,\, \frac{1}{3} \,,\, \frac{1}{4} \,,\, \frac{2}{5} \,,\, \frac{2}{7}$$

(B)

10. If n is odd integer, which of the following must be odd?

I. 2n+n   II. n+n   III. n x n x n

[Sample Question]

A. I only
B. II only
C. III only
D. I and III only

$O + O$
E

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$O \times O \times O = O$

3×5

$15 \times 3 = 45$

$2n+n = n+n+n$

$O + O + n$

$E + O$

$= O$

11. The strength of BBA class is 42 of whom 33.3% are experienced and others freshers. There are 20 females in the class of whom 80% are freshers. How many experienced male students are there in the class?

A. 4
B. 10
C. 12
D. 16.

$\frac{42}{3}$

B

$\frac{1}{3}$

42

SAMPLE

$\frac{28}{F} \Bigg| \frac{14}{E\ (1/3)}$

$20F \rightarrow 80\%\ freshers$

$10 \rightarrow 80\%$
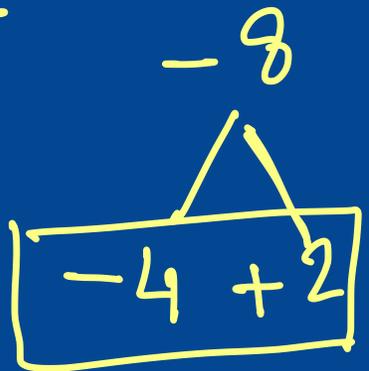
8×2

$\textcircled{16}\ freshers$

$\boxed{4\ Exp}$

12. If $(x - 4)$ is the HCF of $(x^2 - x - 12)$ and $(x^2 - mx - 8)$, then the value of m is

(a) 0

(b) 1

(c) 2

(d) 6

HCF = common

(C)

$(x-4)$

-8

$-4 + 2$

$-4 + 2 = -2$

$x^2 - mx - 8$

$x^2 - 2x - 8$

13. The difference between a two digit number and the number obtained by interchanging the two digits of the number is 9. If the sum of the two digits of the number is 15, then what is the original number?

A. 89
B. 67
C. 87
D. Cannot be determined

14. The HCF and LCM of two natural numbers is 12 and 72 respectively. What is the difference between two numbers, if one of the number is 24?

A. 12
B. 18
C. 21
D. 24
E. 27

(A)

$$HCF \times LCM = product$$

$$12 \times 72 = 24 \times B$$

$$\frac{12 \times 72}{24 \times 1} = B$$

$$B = 36$$

12

15. The LCM of $\frac{1}{3}$, $\frac{5}{6}$, $\frac{2}{9}$, $\frac{4}{27}$ **is**

A. $\frac{1}{54}$

B. $\frac{10}{27}$

C. $\frac{20}{3}$

D. $\frac{27}{3}$

$$\frac{LCM}{HCF}$$

$$\frac{20}{3}$$

5 × 1   4   2 × 2

1 , 5   2 , 4

3 , 6 , 9 , 27

16. If n is a natural number, then $(6n^2 + 6n)$ is always divisible by:
A. Both 6 and 12
B. 6 Only
C. 12 only
D. None of these

A

$6 \times even$

$6n^2 + 6n$

$6n(n + 1)$

$O \times E = E$

$E \times O = E$

17. A man is 24 years older than his son. In two years, his age will be twice the age of his son. What is the present age of his son?

A. 23
B. 22
C. 21
D. 20

simultaneous

HW

$$Dividend = Divisor \times Q + R$$

18. On dividing a number by 56, we get 29 as remainder. On dividing the same number by 8, what will be the remainder?
A. 2
B. 3
C. 4
D. 5

$$x = 56 \times Q + 29$$

$$x = 8 \times Q + \boxed{R}$$

D

$$56 + 29 = \frac{85}{8} = 10$$

$$R = 5$$

$$\frac{29}{8} = 5$$

19. Three numbers are in the ratio 1:2:3 and their HCF is 12. The numbers are

(A) 12, 24, 36

(C) 4, 8, 12

(B) 5, 10, 15

(D) 10, 20, 30

HCF

$A = 12 \times 1x = 12$

$B = 12 \times 2x = 24$

$C = 12 \times 3x = 36$

$7 \longrightarrow 16$ $16-7 = 9$

20. How many numbers are therefrom 300 to 700 which are divisible by 2, 3 and 7?

A.   7
B.   8
C.   9
D.   10

$LCM = 2, 3, 7$
$= 6 \times 7 = 42$

C

$42 \times 10 = 420$

$42 \times 7 = 40 \times 7 =$

280

$2 \times 7 = 14$

292

$\dfrac{300}{42} = \boxed{7}$

$R = 8$

$\dfrac{700}{42} \quad 16$

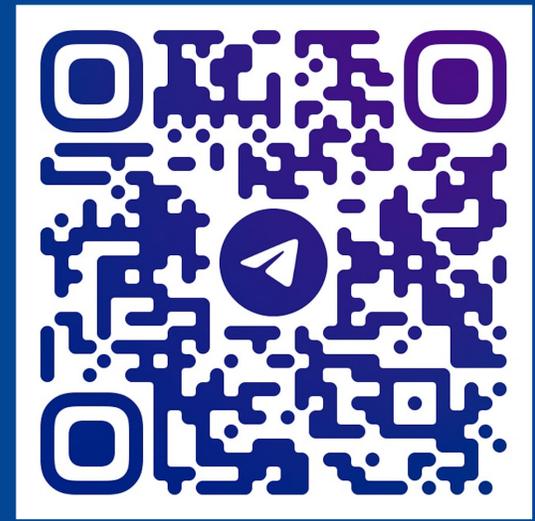280

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