



GENERAL APTITUDE

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PROPERTIES OF DIVISIBILITY

To find a number completely divisible by another :

A) Greatest 'n' digit number exactly divisible by a Number :

Method : By subtracting the remainder

e.g a) Greatest 3 digit number divisible by 13

Greatest 3 digit number = 999. $999/13$ gives remainder 11.

$999 - 11 = 988$ = Greatest 3 digit number divisible by 13

B) Least 'n' digit number exactly divisible by a Number :

Method : By adding the (divisor – remainder)

e.g b) Least 3 digit number divisible by 13

Least 3 digit number = 100. $100/13$ gives remainder 9

$100 + (13 - 9) = 104$ = Least 3 digit number divisible by 13



PROPERTIES OF DIVISIBILITY

Q. On dividing a number by 999, the quotient is 366 and the remainder is 103. The number is:

A.364724 B.365387 C.365737 D.366757 E. None of these

Soln-

$$\text{dividend} = \text{divisor} \times \text{quotient} + \text{remainder}$$

$$\begin{aligned}\text{Required number} &= 999 \times 366 + 103 \\ &= (1000 - 1) \times 366 + 103 \\ &= 366000 - 366 + 103 \\ &= 365737\end{aligned}$$

Ans: C



PROPERTIES OF DIVISIBILITY

Q. A number when divided by 5 leaves 3 as remainder. If the square of the same number is divided by 5, the remainder obtained is :

A. 9

B. 4

C. 1

D. 3

Soln:

number when divided by 5 leaves a remainder 3

Let the given number = $5n + 3$ ---> using dividend = divisor quotient + remainder

Square of the number = $(5n + 3)^2$

$$= 25n^2 + 30n + 9 \rightarrow (a + b)^2 = a^2 + 2ab + b^2$$

$$= 5 \times 5n^2 + 5 \times 6n + 5 + 4$$

$$= 5(5n^2 + 6n + 1) + 4$$

Required remainder = 4

Ans: B



PRIME NUMBERS

- A number that is divisible only by itself and 1 (e.g. 2, 3, 5, 7, 11).
- There are **25** prime numbers between 1 - 100
- *1 is neither prime nor composite number.*
- **2 is the only prime number which is even.**
- A number having more than 2 factors is a composite number
- Find prime numbers between 101 and 200??
- There are **21** prime numbers between 101 - 200



Co-Prime

- When two numbers (they may not be prime) do not have any common factor other than one between them they are called co-prime or relatively prime.
- It is obvious that two prime numbers are always co-prime. e.g : 17 and 23
- Two composite numbers can also be co-prime. e.g: 16 & 25 do not have any common factor other than one.
- Similarly 84 and 65 do not have any common factor and hence are co-prime.



Prime Number

Q. Find whether 467 is prime or not

Step 1 : Sq root of 467 → Between 21 (441) and 22 (484)

Step 2 : 467 is not divisible by 2, 3, 5, 7, 11, 13, 17, 19. Next prime is 23 which exceeds the square limit.

Therefore 467 is prime.



Prime Number(Assignment)

Q. Which of the following is a prime number?

A. 303

B. 477

C. 113

D. None of these

Ans : C



Numbers(Assignment)

Which of the following is the output of $57 \times 57 + 43 \times 43 + 2 \times 57 \times 43$?

A. 10000

B. 5700

C. 4300

D. 1000

Ans : A



Numbers(Assignment)

Q. Which of the following is the output of 6894×99 ?

A. 685506

B. 682506

C. 683506

D. 684506

Ans: B



Numbers(Assignment)

Q. What is the unit digit in $584 \times 428 \times 667 \times 213$?

A. 2

B. 3

C. 4

D. 5

Ans: A



Numbers(Assignment)

Q. The sum of reciprocals of two consecutive numbers is $15/56$. The first number is

- A. 8 B. 7 C. 6 D. 15.

Ans : B



Divisibility (Assignment)

Q. What percentage of the numbers from 1 to 50 have squares ending in the digit 1?

A. 1 B. 10 C. 11 D. 20

Ans : D



Numbers(Assignment)

Q. If $64^2 - 36^2 = 20 \times A$, then $A = ?$

- A. 70 B. 120 C. 180 D. 140 E. None of these

Ans: D



Numbers(Assignment)

Q. On dividing a number by 19 the difference between quotient and remainder is 9. The number is?

A. 370

B. 371

C. 361

D. 352

Ans : B



Numbers(Assignment)

Q. $(112 \times 5^4) = ?$

A. 67000 B. 70000 C. 76500 D. 77200 E. None of these

Ans: B



HCF & LCM

HCF / GCF(Highest/Greatest Common Factor)

- HCF of two or more numbers is the greatest / largest / highest/biggest number which can divide those two or more numbers exactly.

Factors of 6 : 1, 2, 3, 6

Factors of 8 : 1, 2, 4, 8

Common 1 & 2 Highest & Common 2

• LCM(Least Common Multiple)

- The LCM of two or more numbers is the smallest / lowest / least number which is exactly divisible by those two or more numbers.

Multiples of 6 : 6, 12, 18, 24, 30, 36, 42, 48, 54,...

Multiples of 8 : 8, 16, 24, 32, 40, 48, 56, 64....

Common 24, 48, Lowest & common 24



HCF (Factorization method)

- Eg. HCF for 136, 144, 168

2	136	144	168
2	68	72	84
2	34	36	42
	17	18	21

↓ NO FURTHER COMMON FACTOR

So HCF = $2 \times 2 \times 2 = 8$

Note : HCF is always \leq the smallest of given numbers



HCF (Factorization method) - (Assignment)

- HCF of 54,72,126 (factorization method)

A. 21 B. 18 C. 36 D. 54

Ans : B



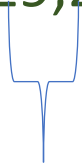
HCF (Difference Method)

- Find HCF of 203,319

Keep smaller here



- (203, 319)
- (116,203)
- (87,116)
- (29,87)
- (29,58)
- (29,29)



HCF =29



HCF (Difference Method) - (Assignment)

- HCF of 161,253 (difference method)

A. 27 B. 18 C. 23 D. 17

Ans : C



HCF (Difference Method)

Q. Find HCF of 84,125

- (84,125)
 - (41,84)
 - (41,43)
 - (2,41)
 - (2,39)
-
- If nothing is common then $HCF = 1$ and numbers are said to be co prime numbers.



HCF & LCM

Q. Find the greatest number which can divide 284, 698 & 1618 leaving the same remainder 8 in each case?

- A. 36 B. 46 C. 56 D. 43.

Soln-

Remainder 8 \rightarrow (numbers – 8) would be exactly divisible.

$$\rightarrow 284 - 8 = 276$$

$$\rightarrow 698 - 8 = 690$$

$$\rightarrow 1618 - 8 = 1610$$

\rightarrow Greatest number dividing above 3 = HCF(276, 690, 1610) (difference method)

$$\rightarrow \text{HCF} = 46$$

Ans: B



HCF & LCM

Q. Find the greatest number which can divide 62, 132 & 237 leaving the same remainder in each case?

- A. 35 B. 46 C. 56 D. 43.

Soln:-

If two numbers a & b are divisible by a number n then

→ Their difference (a-b) is also divisible by n.

$$\rightarrow 132 - 62 = 70$$

$$\rightarrow 237 - 132 = 105$$

$$\rightarrow 237 - 62 = 175$$

→ Greatest number dividing above 3 = $\text{HCF}(70, 105, 175)$

$$\rightarrow \text{HCF} = 35$$

Ans: A



HCF & LCM

Q. Find the largest number such that 43,65,108 are divisible by that number and we get the remainder as 1,2,3 respectively in each case?

A. 21 B. 27 C. 42 D. 63

Soln:

→ (numbers – remainder) would be exactly divisible.

$$\rightarrow 43 - 1 = 42$$

$$\rightarrow 65 - 2 = 63$$

$$\rightarrow 108 - 3 = 105$$

$$\text{HCF}(42, 63, 105) = 21$$

Ans : A



HCF & LCM

Q. A teacher has 25 books, 73 pens & 97 erasers. She wants to distribute them equally to maximum number of students so that after distribution she has equal number of books, pens & erasers left. What is the maximum number of students for such a distribution?

A. 32

B. 21

C. 12

D. 24

Soln:-

If two numbers a & b are divisible by a number n then

→ Their difference (a-b) is also divisible by n.

$$\rightarrow 73 - 25 = 48$$

$$\rightarrow 97 - 73 = 24$$

$$\rightarrow 97 - 25 = 72$$

→ Greatest number dividing above 3 = $\text{HCF}(72, 48, 24)$

$$\rightarrow \text{HCF} = 24$$

Ans: D



HCF & LCM(Assignment)

Q. Find the greatest number which can divide 62, 132 & 237 leaving the same remainder in each case?

- A. 35 B. 46 C. 56 D. 43.

Ans : A



HCF & LCM(Assignment)

Q. Find largest number such that if 45,68 and 113 are divided by that number we get the remainder as 1,2 and 3 respectively.

- A. 21 B. 22 C. 26 D. 24

Ans: B



HCF & LCM(Assignment)

Q. Find the greatest number which can divide 41, 131 & 77 leaving the same remainder in each case?

A. 28

B. 18

C. 36

D. 24

Ans : B



LCM

- Eg. LCM for 18, 28, 108, 105

2	18	28	108	105
2	9	14	54	105
3	9	7	27	105
3	3	7	9	35
3	1	7	3	35
5	1	7	1	35
7	1	7	1	7
Till all quotients are 1				
	1	1	1	1

So LCM = $2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 7 = 3780$

Note : LCM is always \geq the greatest of given nos



LCM(Assignment)

Q. LCM for 12,24,20

A. 210

B. 180

C. 120

D. 144

Ans : C



LCM (Assignment)

Q. Find LCM of 72,125

A. 9000 B. 1200 C. 1000 D. 800

Ans : A



Rules to Remember

- Product of two given numbers is equal to the product of their HCF & LCM

$$A \times B = \text{HCF}(A,B) \times \text{LCM}(A,B)$$

- If a, b, c are three numbers that divide a number n to leave the same remainder r, the smallest value of 'n' is

$$n = (\text{LCM of } a, b, c) + r \quad \text{e.g } 3,4,5 \text{ \& rem } 1$$



Q. Find LCM of 147 & 231

Soln:-

- As we know,
- **HCF X LCM = product**
- Find HCF by difference method
- Put in the formula,
- $21 \times \text{LCM} = (147 \times 231)$
- 1617



Q. Find LCM of 84 and 125

Soln:-

- As they are co-prime numbers the product is the LCM because $HCF = 1$ (for co-primes)
- $HCF \times LCM = \text{product}$
- $1 \times LCM = 84 \times 125$
- $LCM = 10500$



LCM

Q. Find the least number which when divided by 12,15,24 leaves a remainder of 5 in each case

• **Soln:**

• Find $\text{LCM}(12,15,24) = ?$

• $\text{LCM} = 120$

• In an LCM problem, if remainder is common then,

Result = LCM + common remainder

$$= 120 + 5 = 125$$



LCM

Q. Find the smallest number which when divided by 20,36,45 leaves a remainder 15,31 and 40 respectively.

- **Soln:**
- Find LCM(20,36,45)
- In LCM problem , if difference is common(constant) then,
- **Result = LCM – Common difference**

$$\begin{array}{ccc} 20 & 36 & 45 \\ 15 & 31 & 40 \end{array} \left. \vphantom{\begin{array}{ccc} 20 & 36 & 45 \\ 15 & 31 & 40 \end{array}} \right\} 5$$

$$\begin{aligned} \text{Result} &= 180 - 5 \\ &= 175 \end{aligned}$$



Q. Four numbers are in the ratio of 10: 12 : 15 : 18. If their HCF is 3, then find their LCM.

A. 420

B. 540

C. 620

D. 680

Ans : B



Q. Find the least number which when divided by 5,6,7 and 8 leaves a reminder of 3 but when divided by 9 leaves no remainder.

A. 1677

B. 2523

C. 3363

D. 1683

Ans: D



HCF & LCM(Think)

Q. The traffic lights at three different road crossings change after every 48 sec, 72 sec, 108 sec respectively. If they all change simultaneously at 08:20:00 hours, then at what time they will change again simultaneously?

- A. 08:28:12 B. 08:27:12 C. 08:29:00 D. 08:30:00

Ans: B



HCF(Assignment)

Q. In a school of 437 boys & 342 girls it was decided to divide the girls & boys into separate classes. However it was required that each class consist of the same number of students. What would be the number of classrooms required?

A. 41 classrooms B. 14 classrooms C. 17 classrooms D. 26 classrooms

Ans : A

Same Class Size = HCF (Boys, Girls)

→ $\text{HCF}(437, 342) = 19$

→ Boys Classes = $437/19 = 23$

→ Girls Classes = $342/19 = 18$

→ Total Classes = $23 + 18 = 41$



LCM(Assignment)

Q. Find the least number which when divided by 12,15,40 leaves a remainder of 5 in each case

- A. 120 B. 125 C. 130 D. 140

Ans : B



LCM(Assignment)

Q. If the product of two numbers is 324 and their HCF is 3, then their LCM will be = ?

A. 972 B. 327 C. 321 D. 108

Ans: D



LCM(Assignment)

Q. Three number are in the ratio of 3 : 4 : 5 and their L.C.M. is 2400. Their H.C.F. is:

- A. 40 B. 80 C. 120 D. 200

Ans: A



LCM(Assignment)

Q. Find the least number which when divided by 16,18,20 and 25 leaves a reminder of 4 but when divided by 7 leaves no remainder.

A. 17004

B. 18000

C. 18002

D. 18004

Ans: D



Numbers(Assignment)

Q. The number nearest to 43582 divisible by each of 25, 50 and 75 is ?

A. 43500

B. 43550

C. 43600

D. 43650

Ans: D



Numbers(Assignment)

Q. What is the smallest 5 digits number which is divisible by 12, 15, and 18?

A.10010

B. 10015

C.10020

D. 10080

Ans: D



Rules to Remember

- **Fractions :**

LCM = LCM of Numerators / HCF of Denominators

HCF = HCF of Numerators / LCM of Denominators

LCM of 25/12 & 35/18

LCM = 175/6

HCF of 25/12 & 35/18

HCF = 5/36



HCF & LCM Fractions(Assignment)

- Find HCF & LCM of $\frac{5}{9}$ and $\frac{25}{36}$
- Ans : HCF = $\frac{5}{36}$ and LCM = $\frac{25}{9}$



