CDS-AFCAT 1 2025

SSBCrack EXAMS

LIVE

MATHS

NUMBER SYSTEM

CLASS 5

NAVJYOTI SIR

SSBCrack EXAMS

24 Oct 2024 Live Classes Schedule

8:00AM	24 OCTOBER 2024 DAILY CURRENT AFFAIRS	RUBY MA'AM
9:00AM	24 OCTOBER 2024 DAILY DEFENCE UPDATES	DIVYANSHU SIR

NDA 1 2025 LIVE CLASSES

11:30AM	GK - POLITY - JUDICIARY	RUBY MA'AM
1:00PM	CHEMISTRY - PREPARATION & PROPERTIES	SHIVANGI MA'AM
4:00PM	MATHS - ANALYTICAL GEOMETRY 2D - CLASS 4	NAVJYOTI SIR
5:30PM	ENGLISH - USE OF PHRASAL VERBS - CLASS 1	ANURADHA MA'AM

CDS 1 2025 LIVE CLASSES

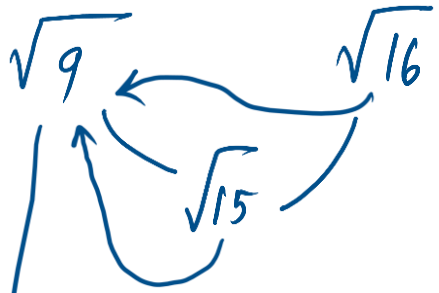
11:30AM	GK - POLITY - JUDICIARY	RUBY MA'AM
1:00PM	CHEMISTRY - PREPARATION & PROPERTIES	SHIVANGI MA'AM
5:30PM	ENGLISH - USE OF PHRASAL VERBS - CLASS 1	ANURADHA MA'AM
7:00PM	MATHS - NUMBER SYSTEM - CLASS 5	NAVJYOTI SIR

AFCAT 1 2025 LIVE CLASSES

4:00PM	STATIC GK - HISTORY - CLASS 2	DIVYANSHU SIR
7:00PM	MATHS - NUMBER SYSTEM - CLASS 5	NAVJYOTI SIR

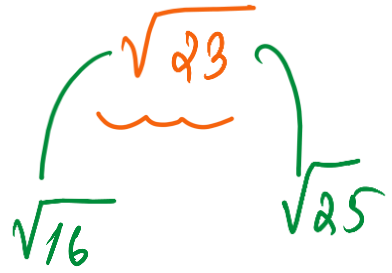
APPROXIMATE SQUARE ROOT VALUE

$\sqrt{15}$



$3 + \left(\frac{\sqrt{15}-9}{\sqrt{16}-9}\right)$ → has to be a proper fraction (value less than 1)

$3 + \frac{6}{7} = 3.85$ (approx.)



$4 + \frac{23-16}{25-16} = 4 + \frac{7}{9}$

$= 4.77$ (approx.)

(4.78)

CDS & AFCAT 1 2025 LIVE CLASS - MATHS - PART 5

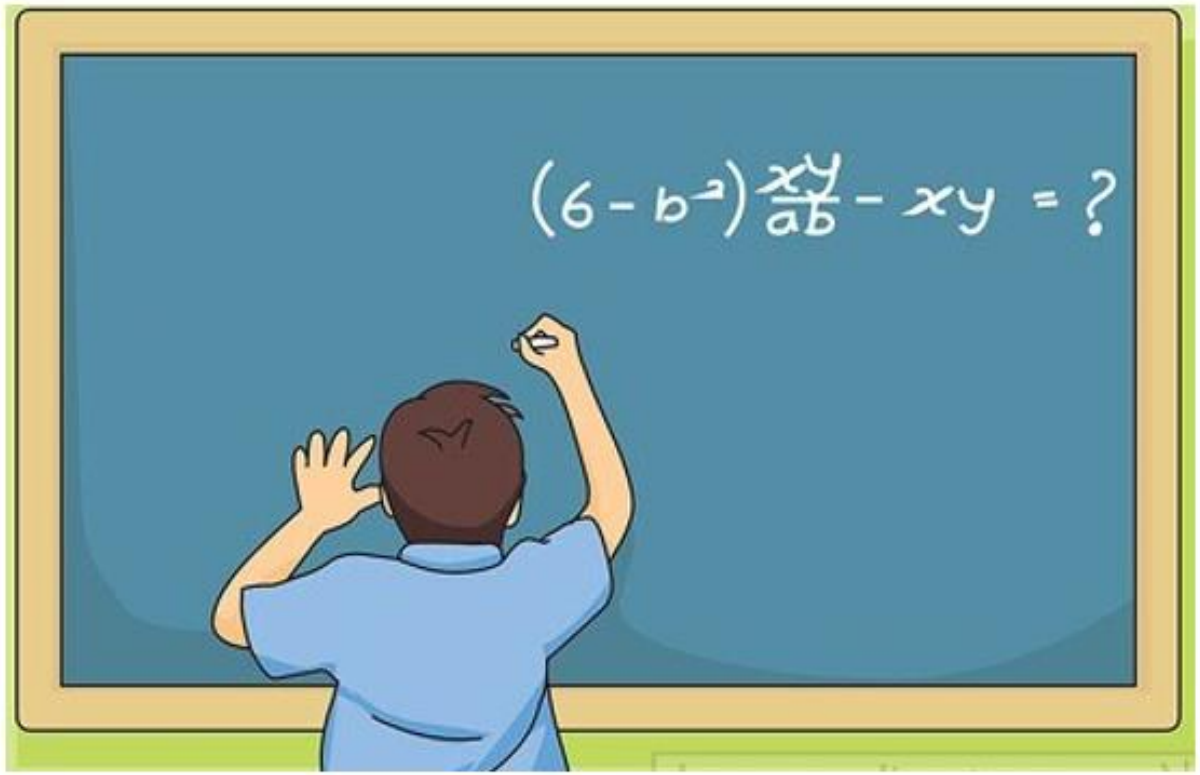
BODMAS RULE

Brackets of Division Multiplication Addition Subtraction

[ ] , { } , ( )

$2 + 5 \div 5 = 3$

PRACTISE
TIME !



Q) What is the remainder after dividing the number 37^{1000} by 9?

(a) 1 (b) 3
(c) 7 (d) 9

$$\frac{(9\times 4+1)^{1000}}{9} = \frac{1^{1000}}{9} = \frac{1}{9} \longrightarrow (1)$$

Q) What is the remainder after dividing the number 37^{1000} by 9?

(a) 1 (b) 3

(c) 7 (d) 9

Ans: (a)

Q) What is the remainder when $27^{27} - 15^{27}$ is divided by 6?

(a) 0 (b) 1 (c) 3 (d) 4

$a^n - b^n$ → $\frac{27^{27} - 15^{27}}{27 - 15}$ ⇒ $\frac{27^{27} - 15^{27}}{12}$ → divisible

if n = odd, divisible by $(a-b)$ and not divisible by $(a+b)$

if divisible by 12, then also divisible by factors of 12.

Q) What is the remainder when $27^{27} - 15^{27}$ is divided by 6?

(a) 0 (b) 1 (c) 3 (d) 4

Ans: (a)

Q) What is the maximum value of m, if the number $N = 90 \times 42 \times 324 \times 55$ is divisible by 3^m?

(a) 8 (b) 7 ✓

(c) 6 (d) 5

$90 \Rightarrow 3^2$ ✓

$42 \Rightarrow 3^1$

$324 \Rightarrow (3^2)^2 = 3^4$

$55 \Rightarrow 3^0$

$2+1+4 = 7$

Q) What is the maximum value of m, if the number $N = 90 \times 42 \times 324 \times 55$ is divisible by 3^m?

(a) 8 (b) 7

(c) 6 (d) 5

Ans: (b)

Q) The digit in the unit's place of the number represented by $(7^{95} - 3^{58})$ is:

(a) 0 (b) 4 ✓

(c) 6 (d) 7

$3 - 9 = -6$

$-6 + 10 = 4$

unit digit = -ve

+ve ⟶ 10 + (-ve)

Q) The digit in the unit's place of the number represented by $(7^{95} - 3^{58})$ is:

(a) 0 (b) 4

(c) 6 (d) 7

Ans: (b)

Q) If x 959 y is divisible by 44 and y > 5, then what are values of the digit x and y ?

(a) x = 7, y = 6 (b) x = 4, y = 8

(c) x = 6, y = 7 (d) None of these

44 → 11 × 4

✓ ✓

(a) 79596

4 — ✓

11 — 18 — ✓ } 44 — ✓

-18

0

Q) If x 959 y is divisible by 44 and y >5, then what are values of the digit x and y ?

(a) $x=7, y=6$ (b) $x=4, y=8$

(c) $x=6, y=7$ (d) None of these

Ans: (a)

Q) The number of prime factors in the expression $(6)^{10} \times (7)^{17} \times (11)^{27}$ is:

(a) 54 (b) 64 (c) 71 (d) 81

$2^{10} \times 3^{10} \times 7^{17} \times 11^{27}$

no. of prime factors $= 10 + 10 + 17 + 27$

$= 64$

Q) The number of prime factors in the expression $(6)^{10} \times (7)^{17} \times (11)^{27}$ is:

(a) 54 (b) 64 (c) 71 (d) 81

Ans: (b)

Q) The seven digit number 876p37q is divisible by 225. The values of p and q can be respectively

(a) 9, 0 ✗ (b) 0, 0 ✗

(c) 0, 5 ✓ (d) 9, 5 ✓

225 ⟶ 25 × 9

$q = 5$

25 ⟶ unit place will be 5.

(c) and (d) both.

Q) The seven digit number 876p37q is divisible by 225. The values of p and q can be respectively

(a) 9, 0 (b) 0, 0

(c) 0, 5 (d) 9, 5

Ans: (d)

Q) If the sum of two numbers is 55 and the H.C.F. and L.C.M. of these numbers are 5 and 120 respectively, then the sum of the reciprocals of the numbers is equal to:

(a) $\frac{55}{601}$ (b) $\frac{601}{55}$ (c) $\frac{11}{120}$ ✓ (d) $\frac{120}{11}$

$a + b = 55$

$ab = LCM \times HCF$

$= 120 \times 5 = 600$

$\frac{1}{a} + \frac{1}{b} = \frac{a+b}{ab} = \frac{55}{600}$

$= \frac{11}{120}$

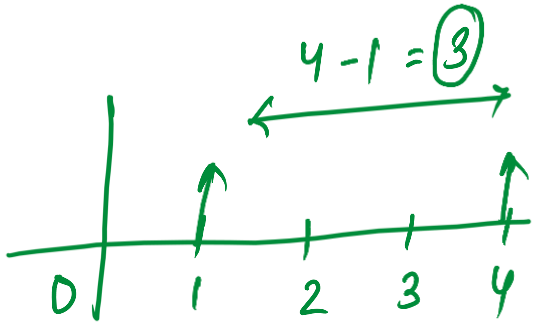
Q) If the sum of two numbers is 55 and the H.C.F. and L.C.M. of these numbers are 5 and 120 respectively, then the sum of the reciprocals of the numbers is equal to:

(a) $\frac{55}{601}$ (b) $\frac{601}{55}$ (c) $\frac{11}{120}$ (d) $\frac{120}{11}$

Ans: (c)

Q) If the points P and Q represent real numbers $0.7\overline{3}$ and $0.5\overline{6}$ on the number line, then what is the distance between P and Q?

(a) $\frac{1}{6}$ (b) $\frac{1}{5}$ (c) $\frac{16}{45}$ (d) $\frac{11}{90}$



$0.\overline{73} = \frac{73-7}{90} = \frac{66}{90}$

$0.5\overline{6} = \frac{56-5}{90} = \frac{51}{90}$

distance = diff.

diff. $= \frac{66-51}{90}$

$= \frac{15}{90} = \frac{1}{6}$

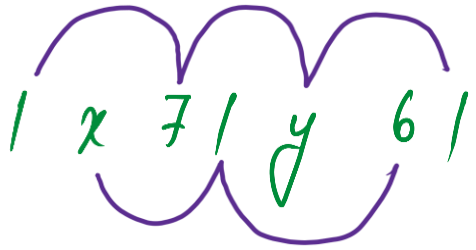
Q) If the points P and Q represent real numbers $0.7\overline{3}$ and $0.5\overline{6}$ on the number line, then what is the distance between P and Q?

(a) $\frac{1}{6}$ (b) $\frac{1}{5}$ (c) $\frac{16}{45}$ (d) $\frac{11}{90}$

Ans: (a)

Q) Minimum difference between x and y such that 1x 71y 61 is exactly divisible by 11 is

(a) 2 (b) 3 (c) 1 (d) 0



$(y + 9) - (x + 7)$

$y - x + 2 = 0$ | $y - x + 2 = 11$

diff. → 2 (+ve)

diff. = 9

min. = 2

Q) Minimum difference between x and y such that 1x 71y 61 is exactly divisible by 11 is

(a) 2 (b) 3 (c) 1 (d) 0

Ans: (a)

Q) The value of

$$\left(\frac{1}{\sqrt{7}-\sqrt{6}}\right)-\left(\frac{1}{\sqrt{6}-\sqrt{5}}\right)+\left(\frac{1}{\sqrt{5}-2}\right)-\left(\frac{1}{\sqrt{8}-\sqrt{7}}\right)+\left(\frac{1}{3-\sqrt{8}}\right)$$ is

(a) 0 (b) 1 (c) 5 (d) 7

$\sqrt{7}+\sqrt{6} - (\sqrt{6}+\sqrt{5}) + (\sqrt{5}+2) - (\sqrt{8}+\sqrt{7})$

$+ (3+\sqrt{8})$

$= 2 + 3 = 5$

$\frac{1}{\sqrt{8}-\sqrt{7}} \times \frac{\sqrt{8}+\sqrt{7}}{\sqrt{8}+\sqrt{7}}$

$= \frac{\sqrt{8}+\sqrt{7}}{8-7} = \sqrt{8}+\sqrt{7}$

Q) The value of

$$\frac{1}{\sqrt{7}-\sqrt{6}}-\frac{1}{\sqrt{6}-\sqrt{5}}+\frac{1}{\sqrt{5}-2}-\frac{1}{\sqrt{8}-\sqrt{7}}+\frac{1}{3-\sqrt{8}} \text{ is}$$

(a) 0 (b) 1 (c) 5 (d) 7

Ans: (c)

Q) What is the unit digit in the expansion of 67^{32}?

(a) 1 (b) 3 (c) 7 (d) 9

Q) What is the unit digit in the expansion of 67^{32}?

(a) 1 (b) 3 (c) 7 (d) 9

Ans: (a)

Q) Three men start together to travel the same way around a circular track of 11 kms. Their speeds are 4, $5\frac{1}{2}$, and 8 kms per hour respectively. When will they meet at the starting point?

(a) 22 hrs ✓ (b) 12 hrs

(c) 11 hrs (d) 44 hrs

LCM of $\frac{11}{4}$, $\frac{2}{1}$ and $\frac{11}{8}$,

$$\frac{LCM(11,2,11)}{HCF(4,1,8)} = \frac{22}{1}$$

$= 22$ hrs

Time taken

$\frac{11}{4}$, $\frac{11}{\left(\frac{11}{2}\right)}$, $\frac{11}{8}$ $\Rightarrow \left(\frac{11}{4}, \frac{2}{1}, \frac{11}{8}\right)$

Q) Three men start together to travel the same way around a circular track of 11 kms. Their speeds are 4, $5\frac{1}{2}$, and 8 kms per hour respectively. When will they meet at the starting point?

(a) 22 hrs
(b) 12 hrs
(c) 11 hrs
(d) 44 hrs

Ans: (a)

Q) One pendulum ticks 57 times in 58 seconds and another 608 times in 609 seconds. If they started simultaneously, find the time after which they will tick together.

(a) $\frac{211}{19}$ s

(b) $\frac{1217}{19}$ s

(c) $\frac{1218}{19}$ s

(d) $\frac{1018}{19}$ s

$$\frac{\text{LCM}}{\text{HCF}} \quad \frac{\text{LCM}(58, 609)}{\text{HCF}(57, 68)}$$

$\frac{58}{57}$ $\frac{609}{68}$ (Time between ticks)

Q) One pendulum ticks 57 times in 58 seconds and another 608 times in 609 seconds. If they started simultaneously, find the time after which they will tick together.

(a) $\frac{211}{19}$ s

(b) $\frac{1217}{19}$ s

(c) $\frac{1218}{19}$ s

(d) $\frac{1018}{19}$ s

Ans: (c)

Q) The sum of first 47 terms of the series

$\frac{1}{4}+\frac{1}{5}-\frac{1}{6}-\frac{1}{4}-\frac{1}{5}+\frac{1}{6}+\frac{1}{4}+\frac{1}{5}-\frac{1}{6}$..... is

(a) 0

(b) $-\frac{1}{6}$ ✓

(c) $\frac{1}{6}$

(d) $\frac{9}{20}$

sum of 42 terms = 0

$\frac{1}{4}+\frac{1}{5}-\frac{1}{6}-\frac{1}{4}-\frac{1}{5}=-\frac{1}{6}$

Q) The sum of first 47 terms of the series

$$\frac{1}{4}+\frac{1}{5}-\frac{1}{6}-\frac{1}{4}-\frac{1}{5}+\frac{1}{6}+\frac{1}{4}+\frac{1}{5}-\frac{1}{6}\ldots\ldots \text{ is}$$

(a) 0

(b) $-\frac{1}{6}$

(c) $\frac{1}{6}$

(d) $\frac{9}{20}$

Ans: (b)

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Q) If 10^n divides $6^{23} \times 75^9 \times 105^2$, then what is the largest value of n?

(a) 20 (b) 22 (c) 23 (d) 28

$(2\times3)^{23} \times (5^2\times3)^9 \times (5\times3\times7)^2$

$10 \longrightarrow 2\times5$

$2^{23} \times 3^{23} \times 5^{18} \times 3^9 \times 5^2 \times 3^2 \times 7^2$

$2^{23}\ 5^{20} \longrightarrow 2^{20}\times5^{20} = 10^{20}$

$n = 20$

= (no. of zeroes at the end)

Q) If 10^n divides $6^{23} \times 75^9 \times 105^2$, then what is the largest value of n?

(a) 20 (b) 22 (c) 23 (d) 28

Ans: (a)

Q) What is the remainder when $(17^{23} + 23^{23} + 29^{23})$ is divided by 23 ?

(a) 0 (b) 1

(c) 2 (d) 3

$$\frac{17^{23}}{23} + \left(\frac{23^{23}}{23}\right) + \frac{29^{23}}{23}$$

$$\frac{17^{23}}{23} + 0 + \frac{29^{23}}{23} \Rightarrow \frac{17^{23}}{23} + \frac{(23\times 1 + 6)^{23}}{23}$$

$$\frac{17^{23}}{23} + \frac{6^{23}}{23}$$

$$\frac{17^{23} + 6^{23}}{23} = \frac{17^{23} + 6^{23}}{17 + 6}$$

$$= 0$$

$$\left(\frac{a^n + b^n}{a + b}\right)$$

(for n = odd → divisible)

Q) What is the remainder when $(17^{23} + 23^{23} + 29^{23})$ is divided by 23 ?

(a) 0
(b) 1
(c) 2
(d) 3

Ans: (a)

Q) Consider the following statements:

(I) There is a finite number of rational numbers between any two rational numbers. ✗

(II) There is an infinite number of rational numbers between any two rational numbers. ✓

(III) There is a finite number of irrational numbers between any two rational numbers.

Which of the above statements is/are correct?

(a) Only I
(b) Only II ✓
(c) Only III
(d) Both I and II

finite → can be counted

Q) Consider the following statements:

(I) There is a finite number of rational numbers between any two rational numbers.

(II) There is an infinite number of rational numbers between any two rational numbers.

(III) There is a finite number of irrational numbers between any two rational numbers.

Which of the above statements is/are correct?

(a) Only I
(b) Only II
(c) Only III
(d) Both I and II

Ans: (b)

Q) If $\frac{1}{1\times 2}+\frac{1}{2\times 3}+\frac{1}{3\times 4}+\ldots+\frac{1}{n(n+1)}=\frac{99}{100}$ then what is the value of n?

(a) 98 (b) 99 (c) 100 (d) 101

$$\frac{1}{n}-\frac{1}{n+1}$$

$$\frac{1}{1}-\frac{1}{2}+\frac{1}{2}-\frac{1}{3}+\frac{1}{3}-\frac{1}{4}+\cdots\left(\frac{1}{n}-\frac{1}{n+1}\right)=\frac{99}{100}$$

$$1-\frac{1}{n+1}=\frac{99}{100}$$

Q) If $\frac{1}{1\times 2}+\frac{1}{2\times 3}+\frac{1}{3\times 4}+\ldots+\frac{1}{n(n+1)}=\frac{99}{100}$ then what is the value of n?

(a) 98 (b) 99 (c) 100 (d) 101

Ans: (b)

Q) The highest four-digit number which is divisible by each of the numbers 16, 36, 45, 48 is

(a) 9180 (b) 9360 (c) 9630 (d) 9840

16 ⟶

36 ⟶ 9 × 4

45 ⟶ 5 × 9

48 ⟶ 16 × 3

Two factors have to be co-prime.

Q) The highest four-digit number which is divisible by each of the numbers 16, 36, 45, 48 is

(*a*) 9180 (*b*) 9360 (*c*) 9630 (*d*) 9840

Ans: (b)

Q) What is the remainder when $(17^{29} + 19^{29})$ is divided by 18?

(a) 6 (b) 2 (c) 1 (d) 0

Q) What is the remainder when $(17^{29} + 19^{29})$ is divided by 18?

(a) 6 (b) 2 (c) 1 (d) 0

Ans: (d)

Q) The expression $5^{2n} - 2^{3n}$ has a factor

(a) 3 (b) 7

(c) 17 (d) None of the above

Q) The expression $5^{2n} - 2^{3n}$ has a factor

(a) 3 (b) 7

(c) 17 (d) None of the above

Ans: (c)

Q) Which one of the following is the largest divisor of $3^x + 3^{x+1} + 3^{x+2}$, if x is any natural number?

(a) 3 (b) 13 (c) 39 (d) 117

Q) Which one of the following is the largest divisor of $3^x + 3^{x+1} + 3^{x+2}$, if x is any natural number?

(a) 3 (b) 13 (c) 39 (d) 117

Ans: (c)

Q) Consider the following statements:

If p is a prime such that $p + 2$ is also a prime, then

I. $p(p + 2) + 1$ is a perfect square.

II. 12 is a divisor of $p + (p + 2)$, if $p > 3$.

Which of the above statements is/are correct ?

(a) Only I

(b) Only II

(c) Both I and II

(d) Neither I nor II

Q) Consider the following statements:

If p is a prime such that $p + 2$ is also a prime, then

I. $p(p + 2) + 1$ is a perfect square.

II. 12 is a divisor of $p + (p + 2)$, if $p > 3$.

Which of the above statements is/are correct ?

(a) Only I
(b) Only II
(c) Both I and II
(d) Neither I nor II

Ans: (c)

Q) Which one of the following is correct?

The sum of two irrational numbers

(a) is always a natural or irrational

(b) may be rational or irrational

(c) is always a rational number

(d) is always an irrational number

Q) Which one of the following is correct?

The sum of two irrational numbers

(a) is always a natural or irrational

(b) may be rational or irrational

(c) is always a rational number

(d) is always an irrational number

Ans: (b)

Q) If we divide a positive integer by another positive integer, what is the resulting number?

(a) It is always a natural number
(b) It is always an integer
(c) It is a rational number
(d) It is an irrational number

Q) If we divide a positive integer by another positive integer, what is the resulting number?

(a) It is always a natural number
(b) It is always an integer
(c) It is a rational number
(d) It is an irrational number

Ans: (c)

Q) Consider the following statements in respect of three 3-digit numbers XYZ, YZX and ZXY :

1. The sum of the numbers is not divisible by $(X+Y+Z)$.
2. The sum of the numbers is divisible by 111.

Which of the above statements is/are correct?

(*a*) 1 only (*b*) 2 only

(*c*) Both 1 and 2 (*d*) Neither 1 nor 2

Q) Consider the following statements in respect of three 3-digit numbers XYZ, YZX and ZXY :

1. The sum of the numbers is not divisible by $(X+Y+Z)$.
2. The sum of the numbers is divisible by 111.

Which of the above statements is/are correct?

(*a*) 1 only (*b*) 2 only

(*c*) Both 1 and 2 (*d*) Neither 1 nor 2

Ans: (b)

Q) The least number that should be added to 2055 so that the sum is exactly divisible by 27 :

(a) 24 (b) 27 (c) 31 (d) 28

Q) The least number that should be added to 2055 so that the sum is exactly divisible by 27 :

(a) 24 (b) 27 (c) 31 (d) 28

Ans: (a)

Q) Let x be the least number, which when divided by 5, 6, 7 and 8 leaves a remainder 3 in each case but when divided by 9 leaves no remainder. The sum of digits of x is

(a) 22 (b) 21 (c) 18 (d) 24

Q) Let x be the least number, which when divided by 5, 6, 7 and 8 leaves a remainder 3 in each case but when divided by 9 leaves no remainder. The sum of digits of x is

(a) 22 (b) 21 (c) 18 (d) 24

Ans: (c)

Q) I have a certain number of beads which lie between 600 and 900. If 2 beads are taken away the remainder can be equally divided among 3, 4, 5, 6, 7 or 12 boys. The number of beads I have

(a) 729 (b) 842 (c) 576 (d) 961

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(a) 729 (b) 842 (c) 576 (d) 961

Ans: (b)

Q) A hall is 13 metres 53 cm long and 8 metres 61 cm broad is to be paved with minimum number of square tiles. The number of tiles required is:

(a) 123 (b) 77 (c) 99 (d) 57

Q) A hall is 13 metres 53 cm long and 8 metres 61 cm broad is to be paved with minimum number of square tiles. The number of tiles required is:

(a) 123 (b) 77 (c) 99 (d) 57

Ans: (b)

Q) Three wheels can complete respectively 60,36,24 revolutions per minute. There is a red spot on each wheel that touches the ground at time zero. After how much time, all these spots will simultaneously touch the ground again?

(a) 5/2 seconds (b) 5/3 seconds

(c) 5 seconds (d) 7.5 seconds

Q) Three wheels can complete respectively 60,36,24 revolutions per minute. There is a red spot on each wheel that touches the ground at time zero. After how much time, all these spots will simultaneously touch the ground again?

(a) 5/2 seconds (b) 5/3 seconds

(c) 5 seconds (d) 7.5 seconds

Ans: (c)

Q) Every prime number of the form $3k + 1$ can be represented in the form $6m + 1$ (where, k and m are integers), when

(a) k is odd

(b) k is even

(c) k can be both odd and even

(d) No such form is possible

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(a) k is odd

(b) k is even

(c) k can be both odd and even

(d) No such form is possible

Ans: (b)

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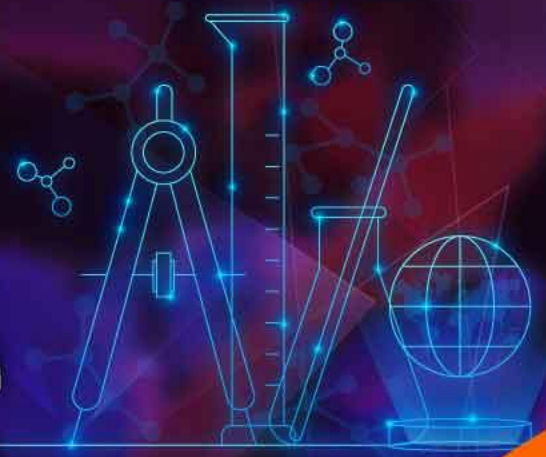
MENSURATION 2D

CLASS 1



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