



MATHS

BOOKS - HT Olympiad Previous Year Paper

PLAYING WITH NUMBERS

Mathematical Reasoning

1. If a number p is exactly divisible by q , then q is a _____ of p and $p \div q$ will have _____ as the remainder.

A. multiple, one

B. factor, one

C. factor, zero

D. multiple, zero

Answer: C



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2. What least value should be given to * so that the number 653 * 47 is divisible by 11? 1 (b) 4 (c) 2 (d) 6

A. 9

B. 6

C. 7

D. 1

Answer: D



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3. Which of the following numbers is not divisible by 8?

A. 34672

B. 84132

C. 13456

D. 14568

Answer: B



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4. Find the least number which when divided by 20, 25, 35 and 40 leaves remainders 14, 19, 29 and 34 respectively.

A. 1394

B. 1404

C. 1664

D. 1406

Answer: A



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5. The HCF of two consecutive odd numbers is

A. 2

B. 0

C. 4

D. 1

Answer: D



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6. HCF of two numbers is 28 and their LCM is 336. If one number is 112, then the other number is

A. 64

B. 84

C. 34

D. 92

Answer: B



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7. Which of the following statements is true?

A. 1 is the smallest prime number

- B. If two numbers are co-primes, then at least one of them must be a prime number.
- C. If a number is prime, it must be odd.
- D. Two consecutive odd prime numbers are always twin primes

Answer: D



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8. Observe the following pattern and find the sum of

$$1 + 3 + 5 + 7 + 9 + \dots + 19.$$

$$1 = 1 \times 1 = 1$$

$$1 + 3 = 2 \times 2 = 4$$

$$1 + 3 + 5 = 3 \times 3 = 9$$

$$1 + 3 + 5 + 7 = 4 \times 4 = 16$$

$$1 + 3 + 5 + 7 + 9 = 5 \times 5 = 25$$

A. 121

B. 81

C. 100

D. 64

Answer: C



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9. If a and b are co-primes, then their LCM is .

A. 1

B. $\frac{m}{n}$

C. mn

D. None of these

Answer: C



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10. Determine the two numbers nearest to 10000 which are exactly divisible by each of 2, 3, 4, 5, 6 and 7

A. 9660, 10080

B. 9320, 10080

C. 9660, 10060

D. 10340, 10080

Answer: A



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11. The co-prime numbers from the following pairs, are _____

A. 7 and 63

B. 36 and 25

C. 35 and 21

D. 63 and 81

Answer: B



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12. The H.C.F. and L.C.M. of two numbers are 13 and 1989 respectively.

If one of the numbers is 117, determine the other.

A. 119

B. 221

C. 338

D. 439

Answer: C



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13. H.C.F. of two numbers =

- A. Product of two numbers + their L.C.M.
- B. Product of two numbers - their L.C.M.
- C. Product of two numbers \times their L.C.M.
- D. Product of two numbers \div their L.C.M.

Answer: D



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14. A number is always divisible by 90, if _____

- A. It is divisible by both 2 and 45
- B. It is divisible by both 5 and 18

C. It is divisible by both 9 and 10

D. All of these

Answer: D



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15. The reciprocal of the smallest prime number is _____

A. 0

B. $\frac{1}{2}$

C. 1

D. 2

Answer: B



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16. The product of three consecutive natural number is always divisible by

A. 4

B. 6

C. 12

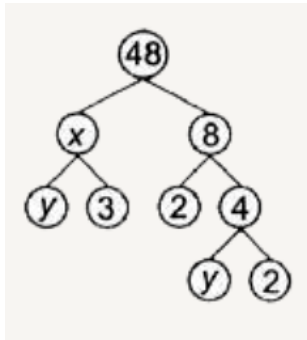
D. 24

Answer: B



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17. Find the value of $\frac{x}{y}$



A. 2

B. 6

C. 4

D. 3

Answer: D



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18. The least number which when decreased by 9 is exactly divisible by 12, 16, 24 and 48 is _____

A. 16

B. 48

C. 57

D. 39

Answer: C



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19. Find the greatest number which will divide the greatest 3-digit number and the greatest 4-digit number exactly

A. 9

B. 8

C. 7

D. 3

Answer: A



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20. The smallest digit which can replace * to make $201 * 58$ divisible by 9 is

A. 1

B. 2

C. 3

D. 4

Answer: B



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Everyday Mathematics

1. The students in a class can be divided into groups of 2, 3, 5 and 6.

What is the least number of children this class can have.

A. 40

B. 30

C. 35

D. 42

Answer: B



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2. The least number of square tiles that will be needed to pave a plot 225 m by 30 m is _____

A. 30 tiles

B. 15 tiles

C. 25 tiles

D. 45 tiles

Answer: A



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3. Three boys step off together from the same spot. Their steps measure 63 cm, 70 cm and 77 cm respectively. What is the minimum distance each should cover so that all can cover the distance in complete steps?

A. 6930 cm

B. 6000 cm

C. 7000 cm

D. 6520 cm

Answer: A



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4. Two tankers contain 850 litres and 680 liters of kerosene oil respectively. Find the maximum capacity of a container which can measure the kerosene oil of both the tankers when used an exact number of times.

A. 170 litres

B. 85 litres

C. 34 litres

D. 10 litres

Answer: A



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5. The length, breadth and height of a room are 403 cm, 434 cm and 465 cm respectively. Find the length of the longest tape which can measure the three dimensions of the room exactly

A. 31 cm

B. 30 cm

C. 25 cm

D. 35 cm

Answer: A



Achievers Section Hots

1. State 'T' for true and 'F' for false.

(i) If an even number is divided by 2, then the quotient is always odd.

(ii) All even numbers are composite numbers.

(iii) The L.C.M. of two co-prime numbers cannot be equal to their product.

(iv) Every number is a factor of itself.

A. (i) (ii) (iii) (iv)
T T F F

B. (i) (ii) (iii) (iv)
F F F T

C. (i) (ii) (iii) (iv)
T F T T

D. (i) (ii) (iii) (iv)
F F T T

Answer: B



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2. Read the following statements.

Statement-1: A number for which sum of all its factors is equal to twice the number is called a perfect number.

Statement-2: If two numbers are divisible by a number, then their sum and difference are also divisible by that number.

Which of the following options holds?

- A. Both Statement-1 and Statement-2 are true.
- B. Statement-1 is true but Statement-2 is false.
- C. Statement-1 is false but Statement-2 is true.
- D. Both Statement-1 and Statement-2 are false

Answer: A



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3. Fill in the blanks.

(i) The H.C.F. of two co-prime numbers is P

(ii) Two natural numbers which have no common factor except 1 are called Q numbers.

(iii) If a number is divisible by 9, then sum of its digits must be divisible by R

A.

P	Q	R
1	prime	3

B.

P	Q	R
1	co-prime	9

C.

P	Q	R
0	prime	9

D.

P	Q	R
0	co-prime	9

Answer: B



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4. Find the value of $a + b + c$, if $373a$ is divisible by 9, $473b$ is divisible by 11 and $371c$ is divisible by 6.

A. 7

B. 6

C. 0

D. 9

Answer: D



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5. Match the following.

Column I

Column II

(i) Prime factors of 125 is

P. 2

(ii) Common prime factor of 16 and 50 is

Q. 4

(iii) Smallest composite number is

R. 5

(iv) If the L.C.M. of 14 and 21 is 42, then their H.C.F. is

S. 7

- A. (i) (ii) (iii) (iv)
R Q P S
- B. (i) (ii) (iii) (iv)
P R S Q
- C. (i) (ii) (iii) (iv)
R P Q S
- D. (i) (ii) (iii) (iv)
P S Q R

Answer: C



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