MATHS

BOOKS - R G PUBLICATION

REAL NUMBERS

Example

1. Use Euclid's division algorithm to find the H.C.F of 408 and 1032.

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2. Use Euclid's division algorithm to find the H.C.F of 4052 and 12576.

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3. Find the HCF of 65 and 117 and express it in the form 65x+117y.

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4. If the HCF of 210 and 55 is expressible in the form $210 \times 5 + 5y$ find y.

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5. Show that $\sqrt{2}$is an irrational number.

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6. Proof that $3\sqrt{3}$ is an irrational number.

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7. Give an example each,of two irrational number whose (i)difference is a rational number.

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8. Give an example each,of two irrational number whose (ii)difference is an irrational number.

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9. Give an example each,of two irrational number whose (iii)sum is a rational number.

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10. Give an example each,of two irrational number whose (iv)sum is an irrational number.

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11. Is π a rational number?

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Exercise

1. Use Euclid's division algorithm to find the HCF of

:(i) 135 and 225

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2. Use Euclid's division algorithm to find the HCF of

:(ii) 196 and 38220

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3. Use Euclid's division algorithm to find the HCF of

:(iii) 867 and 225

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4. Show that any positive odd interger is of the form 6q+1,or 6q+3,or 6q+5,where q is some integer.

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5. An army contingent of 616 members is to march behind an army band of 32 members in a parade. The two groups are to march in the same number of columns.What is the maximum number of columns in which they can march?

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6. Use Euclid's division lemma to show that the square of any positive integer is either of the form 3m or 3m+1 for some integer m.

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7. Use Euclid's division lemma to show that the cube of any positive integer is of the form 9m,9m+1 or 9m+8.

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8. Express each number as a product of its prime factors:(i)140

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9. Express each number as a product of its prime factors:(ii) 156

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10. Express each number as a product of its prime factors:(iii)3825

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11. Express each number as a product of its prime factors:(iv)5005

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12. Express each number as a product of its prime factors:(v)7429

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13. Find the LCM and HCF of the following pairs of integer and verify that $LCM \times HCF$=product of the two numbers: (i) 26 and 91

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14. Find the LCM and HCF of the following pairs of integer and verify that $LCM \times HCF$=product of the two numbers: (ii) 510 and 92

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15. Find the LCM and HCF of the following pairs of integer and verify that $LCM \times HCF$=product of the two numbers: (iii) 336 and 54

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16. Find the LCM and HCF of the following integers by applying the prime factorisation method:(i) 12,15 and 21

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17. Find the LCM and HCF of the following integers by applying the prime factorisation method:(i) 17,23 and 29

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18. Find the LCM and HCF of the following integers by applying the prime factorisation method:(iii) 8,9 and 25

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19. Given that HCF (306,657)=9,find LCM (306,657)

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20. Check whether 6^n can end with the digit 0 for any natural number n.

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21. Explain why $7 \times 11 \times 13 + 13$ and $7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 + 5$ are composite numbers.

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22. There is a circular path around a sports field.Sonia takes 18 minutes to drive one round of the field,while Ravi takes 12 minutes for the same.Suppose they both start at the same point and at the same time,and go in the same direction.After how many minutes will they meet again at the starting point?

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23. Prove that $\sqrt{5}$ is irrational.

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24. Prove that $3 + 2\sqrt{5}$ is irrational.

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25. Prove that the following are irrationals:(i) $\frac{1}{\sqrt{2}}$

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26. Prove that the following are irrationals:(ii) $7\sqrt{5}$

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27. Prove that the following are irrationals:(iii) $6+\sqrt{2}$

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28. Without actually performing the long division,state whether the following rational numbers will have a terminating decimal expansion or a non-terminating repeating decimal expansion:

(i) 13/3125

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29. Without actually performing the long division,state whether the following rational numbers will have a terminating decimal expansion or a non-terminating repeating decimal expansion: (ii)17/8

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30. Without actually performing the long division,state whether the following rational numbers will have a terminating decimal expansion

or a non-terminating repeating decimal expansion:

(iii) 64/455

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31. Without actually performing the long division,state whether the following rational numbers will have a terminating decimal expansion or a non-terminating repeating decimal expansion:

(iv)15/1600

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32. Without actually performing the long division,state whether the following rational numbers will have a terminating decimal expansion or a non-terminating repeating decimal expansion: (v)29/343

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33. Without actually performing the long division,state whether the following rational numbers will have a terminating decimal expansion

or a non-terminating repeating decimal expansion:

(vi) $\frac{23}{2^3(5^2)}$

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34. Without actually performing the long division,state whether the following rational numbers will have a terminating decimal expansion or a non-terminating repeating decimal expansion:

(vii) $\frac{129}{(2^2)(5^7)(7^5)}$

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35. Without actually performing the long division,state whether the following rational numbers will have a terminating decimal expansion or a non-terminating repeating decimal expansion:

(viii) 6/15

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36. Without actually performing the long division,state whether the following rational numbers will have a terminating decimal expansion or a non-terminating repeating decimal expansion:

(viii) 6/15

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37. Without actually performing the long division,state whether the following rational numbers will have a terminating decimal expansion or a non-terminating repeating decimal expansion: (x)77/210

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38. The following real numbers have decimal expansions as given below.In each case,decide

whether they are rational or not.If they are rational,and of the form p/q,what can you say about the prime factors of q?(i)43.123456789

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39. The following real numbers have decimal expansions as given below.In each case,decide whether they are rational or not.If they are rational,and of the form p/q,what can you say about the prime factors of q?(ii) 0.12012001200012000....

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40. The following real numbers have decimal expansions as given below.In each case,decide whether they are rational or not.If they are rational,and of the form p/q,what can you say about the prime factors of q?

(iii) 43.123456789

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41. If a,b are coprime then a^2, b^2 are -- a) prime b)Coprime c)Composite number d) Even number

A. prime

B. Coprime

C. Composite number

D. Even number

Answer:

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42. The product of the HCF and LCM for the number 50 and 20 is

a)20 b)10 c)100 d)1000

A. 20

B. 10

C. 100

D. 1000

Answer:

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43. The LCM of two numbers is 1200 which of the following cannot be their HCF?

a)600 b)500 c)400 d)200

A. 600

B. 500

C. 400

D. 200

Answer:

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44. If the HCF of 65 and 117 is expressible in the form 65m-117,then the value of m is.

A. 1

B. 2

C. 3

D. 4

Answer:

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45. The co-prime pair is

A. (18,25)

B. (32,62)

C. (14,35)

D. (31,93)

Answer:

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46. If p and q are positive integers such that $p = ab^2$ and $q = a^3b$,where a,b are prime numbers then LCM (p,q) is

A. a^2b^2

B. ab

C. a^3b^3

D. a^3b^2

Answer:

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47. If a and b are positive integers such that $a = x^3y^2$ and $b = xy^3$, where x,y are prime number then HCF (a,b) is

A. xy

B. xy^2

C. x^2y^2

D. x^3y^3

Answer:

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48. If $x = 2^3 \times 3 \times 5^2, y = 2^2 \times 3^3$ the HCF (x,y) is

a)18 b)102 c)12 d) 24

A. 18

B. 102

C. 12

D. 24

Answer:

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49. If $a = 2^2 \times 3^3 \times 5^4$ and $b = 2^3 \times 3^2 \times 5$ then HCF (a,b) is

a)90 b)180 c)360 d)540

A. 90

B. 180

C. 360

D. 540

Answer:

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50. LCM of $\left(2^3 \times 3 \times 5\right)$ and $\left(2^4 \times 5 \times 7\right)$ is

A. 40

B. 560

C. 1680

D. 1120

Answer:

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51. 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)60 b)30 c)48 d)105

A. 60

B. 30

C. 48

D. 105

Answer:

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52. Given that HCF (2520,6600)=40 and LCM(2520,6600)=$252 \times x$ then the value of x is

a)560 b)550 c)660 d)2520

A. 560

B. 550

C. 660

D. 2520

Answer:

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53. Given that HCF (26,91)=13 then LCM of (26,91) is

a)182 b)282 c)192 d)91

A. 182

B. 282

C. 192

D. 91

Answer:

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54. If HCF (26,169)=13,then LCM(26,169) is __

a)13 b)26 c)52 d)338

A. 13

B. 26

C. 52

D. 338

Answer:

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55. If $a = 2^3 \times 3, b = 2 \times 3, c = 3^n \times 5$ and.LCM(a,b,c)=$2^3 \times 3^2 \times 5$ then n=

a)1 b)2 c)3 d)4

A. 1

B. 2

C. 3

D. 4

Answer:

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56. For some positive integer m,every positive even integer is of the form

a)m-1 b)m+1 c)2m d)2m+1

A. m-1

B. m+1

C. 2m

D. 2m+1

Answer:

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57. For some positive integer n,every positive odd integer is of the form

A. n

B. n+1

C. 2n

D. 2n+1

Answer:

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58. Euclid's division Lemma states that if a and b are any two positive integers,then there exists unique integers q and r such that

A. $a = bq + r, 0 \leq r < b$

B. $a = bq + r, 0 \leq r \leq b$

C. $a = bq + r, 0 < r < b$

D. $a = bq + r, 0 < b < r$

Answer:

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59. $\left(n^2-1\right)$ is divisible by 8,if n is

A. any natural number

B. any odd positive integer

C. any even positive integer

D. any integer

Answer:

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60. If n is a natural number ,then $9^{2n}-4^{2n}$ is always divisible by

a)5 b)13 c)both 5 and 13 d)None of these

A. 5

B. 13

C. both 5 and 13

D. None of these

Answer:

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61. If n is a any natural number ,then $6^n - 5^n$ is always end with

A. 1

B. 3

C. 5

D. 7

Answer:

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62. The LCM and HCF of two rational numbers are equal,then the numbers must be

a)equal b)prime c)Co-prime d)Composite

A. equal

B. prime

C. Co-prime

D. Composite

Answer:

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63. If P_1 and P_2 are two odd prime numbers such that $P_1 > P_2$ then $P_1^2 - P_2^2$ is

A. a prime number

B. an odd prime number

C. an even number

D. an odd number

Answer:

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64. The demical expansion of $\frac{33}{2^2 \times 5}$ will terminate after

A. one rational number

B. an irrational number

C. an integer

D. None of these

Answer:

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65. $2.\overline{35}$ is

A. a rational number

B. an irrational number

C. an integer

D. None of these

Answer:

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66. π is

A. a rational number

B. an integer

C. an irrational number

D. None of these

Answer:

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67. 2.13113111311113..... is

A. a rational number

B. an irrational number

C. an integer

D. None of these

Answer:

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68. The simplest form of 1095/1168 is

A. 15/16

B. 17/26

C. 13/16

D. 25/26

Answer:

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69. $\left(2+\sqrt{3}\right)\left(2-\sqrt{3}\right)$ is

A. a rational number

B. an irrational number

C. an integer

D. None of these

Answer:

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70. $\frac{1}{\sqrt{2}}$ is

A. a rational number

B. an irrational number

C. an integer

D. None of these

Answer:

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71. The irrational number is

A. 3.141141114.....

B. 3.1416

C. $3.\overline{1416}$

D. 44399

Answer:

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72. Is π an irrational number?

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73. Every real number is always rational

A. True

B. False

C.

D.

Answer:

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74. Product of two prime numbers is always equal to their LCM. True or False

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75. Numbers of the form 3m+1 are always even. True or False

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76. HCF of two prime numbers is always 1, True or False

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77. If $\sqrt{ab}$ be an irrational number then $\sqrt{a}+\sqrt{b}$ is also irrational number.True or False

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78. Every even integer is of the form 2m,where m is an integer.True or False

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79. The product of any three consecutive natural number is divisible by 6.True or False

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80. State true or false: The sum of two prime numbers is always a prime number.

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81. Euclid's division lemma is applicable to Calculate only___

A. LCM

B. HCF

C. Both

D. None of the above

Answer:

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82. _____ is only even prime number.

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83. ____ is neither prime nor composite.

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84. If a and b are relatively prime number, then their LCM is____

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