



# MATHS

## BOOKS - NCERT MATHS (ENGLISH)

### REAL NUMBERS

#### Multiple Choice Questions

1. For some integer  $m$ , every even integer is of the form

A.  $m$

B.  $m + 1$

C.  $2m$

D.  $2m + 1$

**Answer: C**



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2. For some integer  $q$ , every odd integer is of the form

A.  $q$

B.  $q + 1$

C.  $2q$

D.  $2q + 1$

**Answer: D**



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**3.**  $n^2 - 1$  is divisible by 8, if  $n$  is

A. an integer

B. a natural number

C. an odd number

D. an even number

**Answer: C**



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

A. 4

B. 2

C. 1

D. 3

**Answer: B**



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5. The largest number which divides 70 and 125, leaving remainder 5 and 8 respectively, is

A. 13

B. 65

C. 875

D. 1750

**Answer: A**



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6. If two positive integers  $m$  and  $n$  are expressible in the form  $m = pq^3$  and  $n = p^3q^2$ , where  $p, q$  are prime numbers, then  $\text{HCF}(m, n) =$

A.  $pq$

B.  $pq^2$

C.  $p^3q^3$

D.  $p^2q^2$

**Answer: B**



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7. If two positive integers  $a$  and  $b$  are expressible in the form  $a = pq^2$  and  $b = p^3q$ ;

$p, q$  being prime numbers, then LCM ( $a, b$ ) is

(a)  $pq$  (b)  $p^3 q^3$  (c)  $p^3 q^2$  (d)  $p^2 q^2$

A.  $pq$

B.  $p^2 q^2$

C.  $p^3 q^2$

D.  $p^3 q^3$

**Answer: C**



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8. The product of a non-zero rational number with an irrational number is always a/an

- A. always irrational
- B. always rational
- C. rational or irrational
- D. one

**Answer: A**



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9. What is the least number that is divisible by all the numbers 1 to 10

A. 10

B. 100

C. 504

D. 2520

**Answer: D**



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10. The decimal expansion of the rational number  $\frac{14587}{1250}$  will terminate after

- A. one decimal place
- B. two decimal places
- C. three decimal places
- D. four decimal places

**Answer: D**



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## Very Short Answer Type Questions

1. Write whether every positive integer can be of the form  $4q + 2$  where  $q$  is an integer, Justify your answer



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2. The product of two consecutive integers is divisible by 2. Is this statement true or false. Give Reason?



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3. The product of any three consecutive natural numbers is divisible by 6 (True/false).



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4. Write whether the square of any positive integer can be of the form  $3m+2$ , where  $m$  is a natural number. Justify answer.



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5. A positive integer is the form of  $3q+1$   $q$ , being a natural number. Can you write its square in any form other than  $3m+1$  i.e.  $3m$  or  $3m+2$  for some integer? Justify your answer.



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6. The number 525 and 3000 are both divisible only 3,5,15,25,75. What is HCF (525, 3000)? Justify your answer.



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7. Explain why  $3 \times 5 \times 7 + 7$  is a composite number.



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8. Can two number have 18 as their HCF and 380 as their LCM? Give reason



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9. Without actually performing the long division, find if  $\frac{987}{10500}$  will have terminating or non-terminating (repeating) decimal expansion. Give reasons for your answer



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10. A rational number in its decimal expansion is  $327.7081$ . What can you say about the prime factors of  $q$ , when this number is expressed in the form  $\frac{p}{q}$ ? Give reason







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## Short Answer Type Questions

1. Prove that the square of any positive integer is of the form  $4q$  or  $4q + 1$  for some integer  $q$ .



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2. Show that cube of any positive integer is of the form  $4m$ ,  $4m+1$  or  $4m+3$ , for some integer  $m$ .



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**3.** Show that the square of any positive integer cannot be of the form  $5q+2$  or  $5q+3$  for some integer  $q$ .



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**4.** Show that the square of any positive integer cannot be of the form  $6m+2$  or  $6m+5$  for some integer  $q$ .





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5. Show that the square of any odd integer is of the form  $4m+1$ , for some integer  $m$ .



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6. If  $n$  is an odd positive integer, show that  $(n^2 - 1)$  is divisible by 8.



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7. Prove that if  $x$  and  $y$  are odd positive integers, then  $x^2 + y^2$  is even but not divisible by 4.



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8. Use Euclid division algorithm to find the HCF of 441, 567 and 693.



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9. Using Euclid's division algorithm, find the largest number that divides 1251, 9377 and 15628 leaving remainders 1, 2 and 3, respectively.



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



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**11.** Show that  $12^n$  cannot end with the digits 0 or 5 for any natural number  $n$



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**12.** In a morning walk, three persons step off together and their steps measure  $40\text{cm}$ ,  $42\text{cm}$  and  $45\text{cm}$ , respectively. What is the minimum distance each should walk so that each can cover the same distance in complete steps?

A. 3520

B. 2520

C. 4520

D. 7520

**Answer: B**



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**13.** Write the denominator of the rational number  $\frac{257}{5000}$  in the form  $2^m \times 5^n$ , where  $m$ ,  $n$  and non-negative integers. Hence, write its decimal expansion without actual division.



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14. Prove that  $\sqrt{p} + \sqrt{q}$  is an irrational, where  $p$  and  $q$  are primes.



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## Long Answer Type Questions

1. Show that the cube of a positive integer of the form  $6q + r$ ,  $q$  is an integer and



$r=0,1,2,3,4,5$  is also of the form  $6m+r$



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2. Show that one and only one out of  $n, n + 2$  or  $n + 4$  is divisible by 3, where  $n$  is any positive integer.



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3. Prove that one of every three consecutive positive integers is divisible by 3.



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4. For any positive integer  $n$ , prove that  $n^3 - n$  is divisible by 6.



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5. Show that one and only one out of  $n, n + 4, n + 8, n + 12$  and  $n + 16$  is divisible by 5, where  $n$  is any positive integer.



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