

# Mathematics

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(Chapter - 1) (Real Numbers) (Practice Test 6)

(Class X)

Time: 1 hour 15 minutes

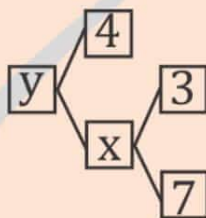
M. M: 50

## General Instructions:

- This question paper contains four sections: A, B, C and D. Each part is compulsory.
- Section A has 10 MCQ of one mark each.
- Section B has 5 questions of two marks each.
- Section C has 6 questions of three marks each. Attempt any 5 out of 6.
- Section D has 5 questions of five marks each, attempt any 3 out of 5.
- There is no negative marking.

### [Section - A]

1. The values of  $x$  and  $y$  in the given figure are:



- (A)  $x = 10; y = 14$  (B)  $x = 21; y = 84$   
(C)  $x = 21; y = 25$  (D)  $x = 10; y = 40$
2. For any positive integer  $a$  and  $3$ , there exist unique integers  $q$  and  $r$  such that  $a = 3q + r$ , where  $r$  must satisfy:  
(A)  $0 \leq r < 3$  (B)  $1 < r < 3$   
(C)  $0 < r < 3$  (D)  $0 < r \leq 3$
3. The HCF and LCM of two numbers are  $33$  and  $264$  respectively. When the first number is completely divided by  $2$  the quotient is  $33$ . The other number is:  
(A)  $66$  (B)  $130$   
(C)  $132$  (D)  $196$
4. What will be the least possible number of the planks, if three pieces of timber  $42$  m,  $49$  m and  $63$  m long have to be divided into planks of the same length?  
(A)  $5$  (B)  $6$   
(C)  $7$  (D) none of these
5. What is the greatest possible speed at which a man can walk  $52$  km and  $91$  km in an exact number of minutes?  
(A)  $17$  m/min (B)  $7$  m/min  
(C)  $13$  m/min (D)  $26$  m/min
6. Pairs of natural numbers whose least common multiple is  $78$  and the greatest common divisor is  $13$  are:  
(A)  $58$  and  $13$  or  $16$  and  $29$  (B)  $68$  and  $23$  or  $36$  and  $49$   
(C)  $18$  and  $73$  or  $56$  and  $93$  (D)  $78$  and  $13$  or  $26$  and  $39$

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7. 4 Bells toll together at 9.00 am. They toll after 7, 8, 11 and 12 seconds respectively. How many times will they toll together again in the next 3 hours?
- (A) 3 (B) 4  
(C) 5 (D) 6
8. A forester wants to plant 66 apple trees, 88 banana trees and 110 mango trees in equal rows (in terms of number of trees). Also, he wants to make distinct rows of trees (i.e., only one type of trees in one row). The number of minimum rows required are
- (A) 2 (B) 3  
(C) 10 (D) 12
9. A number  $10x + y$  is multiplied by another number  $10a + b$  and the result come as  $100p + 10q + r$ , where  $r = 2y$ ,  $q = 2(x + y)$  and  $p = 2x$ ;  $x, y < 5$ ,  $q \neq 0$ . The value of  $10a + b$  may be:
- (A) 11 (B) 13  
(C) 31 (D) 22
10. The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is
- (A) 10 (B) 100  
(C) 504 (D) 2520

### [Section - B]

11. Find the sum  $0.\overline{68} + 0.\overline{73}$ .
12. Find the value of:  $(-1) + (-1)^{2n} + (-1)^{2n+1} + (-1)^{4n+1}$ , where  $n$  is any positive odd integer.
13. Find whether decimal expansion of  $13/64$  is a terminating or non-terminating decimal. If it terminates, find the number of decimal places its decimal expansion has.
14. Write whether the square of any positive integer can be of the form  $3m + 2$ , where  $m$  is a natural number. Justify your answer.
15. "The product of three consecutive positive integers is divisible by 6". Is this statement true or false? Justify your answer.

### [Section - C]

16. Find the largest positive integer that will divide 398, 436 and 542 leaving remainders 7, 11 and 15 respectively.
17. Find the LCM and HCF of 12, 15 and 21 by applying the prime factorization method.
18. Explain whether the number  $3 \times 5 \times 13 \times 46 + 23$  is a prime number or a composite number.
19. Three bells toll at intervals of 12 minutes, 15 minutes and 18 minutes respectively. If they start tolling together, after what time will they next toll together?
20. Check whether  $6n$  can end with the digit 0 for any natural number  $n$ .
21. Using prime factorization method, find the HCF and LCM of 30, 72 and 432. Also show that  $\text{HCF} \times \text{LCM} \neq \text{Product of the three numbers}$ .

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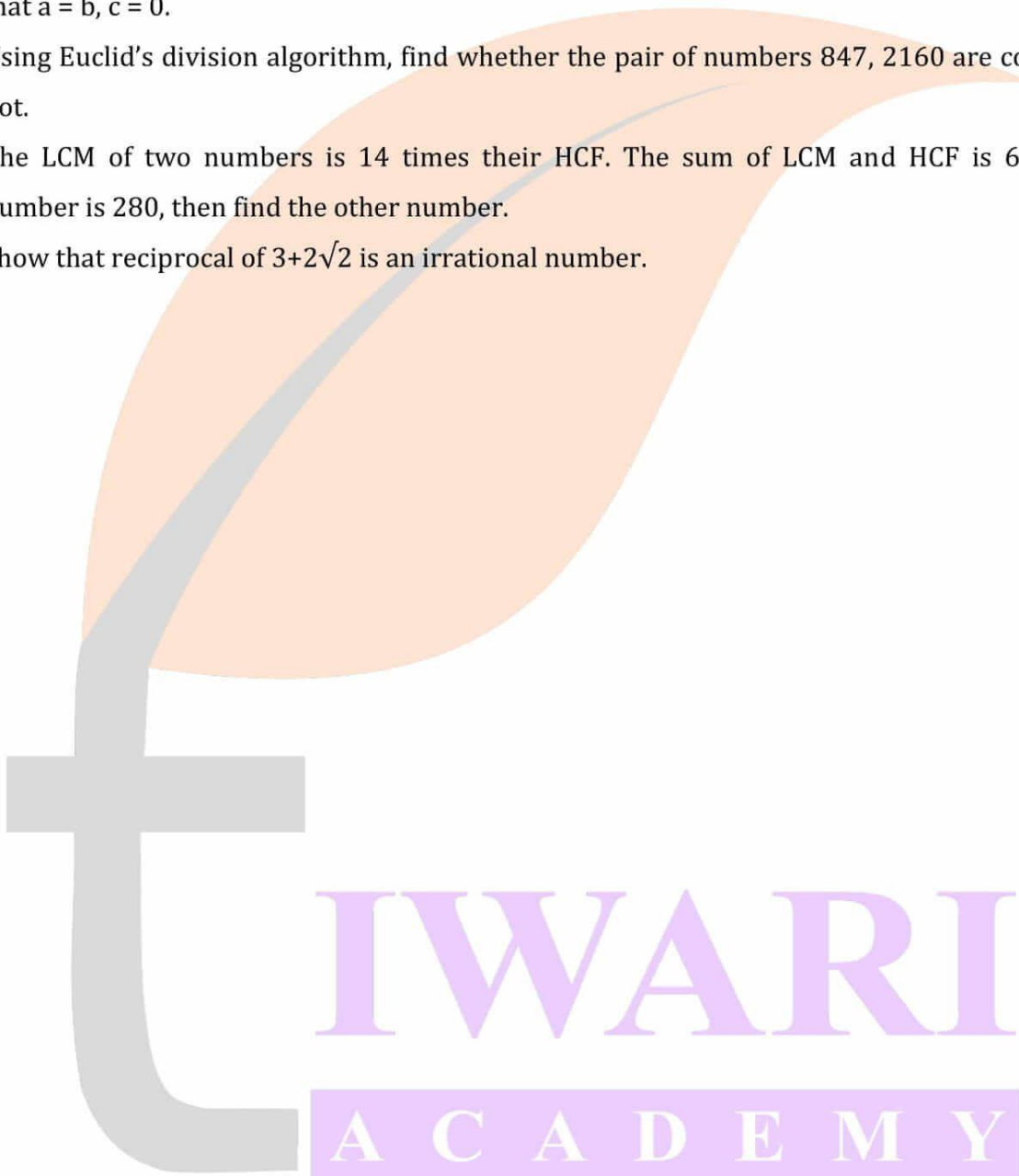
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[Section - D]

22. Show that there is no positive integer  $n$  for which  $\sqrt{n-1} + \sqrt{n+1}$  is rational.
23. Let  $a, b, c, k$  be rational numbers such that  $k$  is not a perfect cube. If  $a + bk^{1/2} + ck^{2/3}$  then prove that  $a = b, c = 0$ .
24. Using Euclid's division algorithm, find whether the pair of numbers 847, 2160 are co-prime or not.
25. The LCM of two numbers is 14 times their HCF. The sum of LCM and HCF is 600. If one number is 280, then find the other number.
26. Show that reciprocal of  $3+2\sqrt{2}$  is an irrational number.



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Hints and Answers

Section - A

1.  $x = 21; y = 84$
2.  $0 \leq r < 3$
3. 132
4. None of these
5. 13 m/min
6. 78 and 13 or 26 and 39
7. 5
8. 12
9. 22
10. 2520

Section - B

11.  $1.\overline{42}$
12. 0
13. terminating

Section - C

16. 17
17. HCF = 3    LCM = 420
18. Composite number
19. After 180 minutes

Section - D

24. coprime
25. 80



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