CLASS NOTES-ANSWERS

EXERCISE 3.5

1. Which of the following statements are true?

(a) If a number is divisible by 3, it must be divisible by 9.

(b) If a number is divisible by 9, it must be divisible by 3.

(c) A number is divisible by 18, if it is divisible by both 3 and 6.

(d) If a number is divisible by 9 and 10 both, then it must be divisible by 90.

(e) If two numbers are co-primes, at least one of them must be prime.

(f) All numbers which are divisible by 4 must also be divisible by 8.

(g) All numbers which are divisible by 8 must also be divisible by 4.

(h) If a number exactly divides two numbers separately, it must exactly divide their sum.

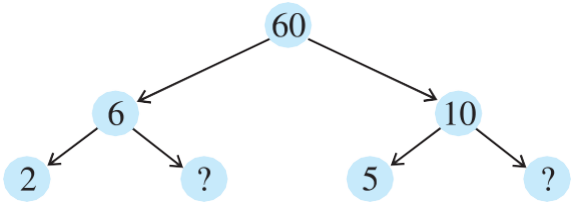
(i) If a number exactly divides the sum of two numbers, it must exactly divide the two numbers separately.

Answer:

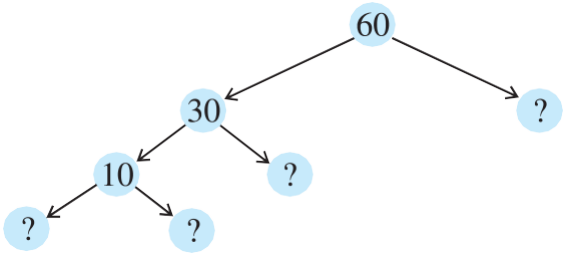
(a) False	(b) True	(c) False	(d) True
(e) False	(f) False	(g) True	(h) True
(i) False			

2. Here are two different factor trees for 60. Write the missing numbers.

(a)

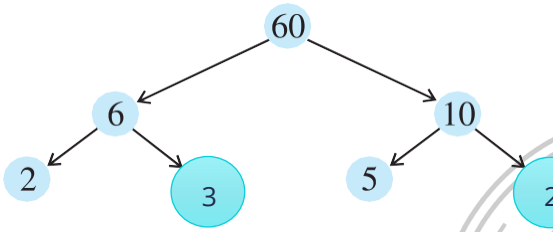


(b)

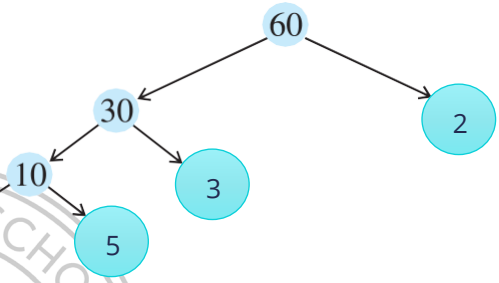


Answer:

a.



b.



3. Which factors are not included in the prime factorisation of a composite number?

Answer:

Example: 42 = 2 × 3 × 7

The prime factors of 42 are 2, 3, and 7. The factors that are not included are 1 and 42 as they are not prime numbers.

Hence, we can say that the number itself and 1 are not included inthe prime factorization of a composite number.

4. Write the greatest 4-digit number and express it in terms of its prime factors.

Answer:

The greatest 4-digit number is 9999.

9999 = 3 × 3 × 11 × 101

Thus, the prime factors of the greatest 4-digit number 9999 are 3, 3, 11, 101.

5. Write the smallest 5-digit number and express it in the form of its prime factors.

Answer:

The smallest 5-digit number is 10000

Thus, the required prime factors of 10000 are $2 \times 2 \times 2 \times 2 \times 5 \times 5 \times 5 \times 5$.

6. Find all the prime factors of 1729 and arrange them in ascending order. Now state the relation, if any; between two consecutive prime factors.

Answer:

All the prime factors of 1729 are $7 \times 13 \times 19$.

The difference between two consecutive prime factors is 6.

Since, 13 - 7 = 6 and 19 - 13 = 6

7. The product of three consecutive numbers is always divisible by 6. Verify this statement with the help of some examples.

Answer:

Example 1:

Let's take three consecutive numbers 19, 20, and 21.

The product of $19 \times 20 \times 21 = 7980$

Now divide 7980 by 6.

$7980 \div 6 = 1330$

Therefore, the product of three consecutive numbers, 19, 20, and 21, is divisible by 6.

Example 2:

Let's take three consecutive numbers 11, 12, and 13.

The product of 11 × 12 × 13 = 1716

Now divide 1716 by 6.

1716 ÷ 6 = 286

Therefore, the product of three consecutive numbers, 11, 12, and 13, is divisible by 6.

8. The sum of two consecutive odd numbers is divisible by 4. Verify this statement with the help of some examples.

Answer:

Example 1:

The sum of two consecutive odd numbers is divisible by 4.

Suppose we have two consecutive odd numbers, 23 and 25.The sum of two consecutive odd numbers = 23 + 25 = 48

The number formed by two consecutive odd numbers, 23 and 25, is 48, divisible by 4.

Example 2:

Let us take another two consecutive odd numbers, 79 and 81.The sum of two consecutive odd numbers = 79 + 81 = 160

The number formed by two consecutive odd numbers, 79 and 81, is 160, divisible by 4.

9. In which of the following expressions, prime factorisation has been done?

(a) 24 = 2 × 3 × 4 (b) 56 = 7 × 2 × 2 × 2

(c) 70 = 2 × 5 × 7 (d) 54 = 2 × 3 × 9

Answer:

(a) 24 = 2 × 3 × 4 – Not correct

(b) 56 = 7 × 2 × 2 × 2 - Correct

(c) 70 = 2 × 5 × 7 - Correct

(d) 54 = 2 × 3 × 9 – Not correct

10. Determine if 25110 is divisible by 45.

[Hint : 5 and 9 are co-prime numbers. Test the divisibility of the number by 5 and 9].

Answer:

45 = 5 × 9

Here, 5 and 9 are co-prime numbers.

Here we have 25110, the unit's digit is 0. So, it is divisible by 5.

For 25110, the sum of the digits is 2 + 5 + 1 + 1 + 0 = 9 which is divisible by 9.

So, the number 25110 is divisible by 5 and 9 both. Hence, it will also be divisible by their product 45.

Hence, the number 25110 is divisible by 45.

11. 18 is divisible by both 2 and 3. It is also divisible by 2 × 3 = 6. Similarly, a number is divisible by both 4 and 6. Can we say that the number must also be divisible by 4 × 6 = 24? If not, give an example to justify your answer

Answer:

If a number is divisible by two co-prime numbers, it is also divisible by theirproduct.

The numbers 2 and 3 are co-prime numbers. Hence, if a number is divisibleby 2 and 3, it should also be divisible by their product i.e., 6.

But now, the numbers 4 and 6 are not co-prime numbers as their HCF is not equal to 1. Thus, if a number is divisible by both 4 and 6 it necessarily doesnot have to be divisible by their product 4 × 6 = 24.

Example: 36 and 48 are divisible by both 4 and 6 but not by 24.

12. I am the smallest number, having four different prime factors. Can you find me?

Answer:

Since it is the smallest number having four different prime factors, thus, it will be the product of the first 4 prime numbers: 2, 3, 5, and 7.

Hence, the required smallest number = 2 × 3 × 5 × 7 = 210