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MBA, B.E., D.E.E., PPDCA, ADCH&N

Advanced Executive Program in Cyber Law, Program in IT Law

Class 6 Mathematics Chapter 3

Exercise 3.5

\* कंप्यूटराइज्ड नोट्स

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\* न्यूनतम शिक्षण शुल्क

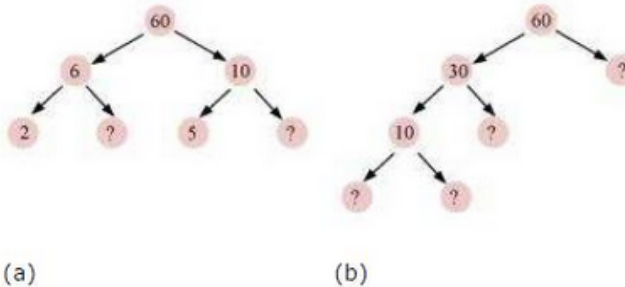
\* नियमित कक्षाये

**Question 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) If a number is divisible by 18, it must be 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.

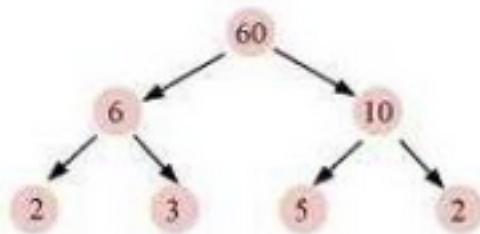
Answer: Statements (b), (c), (d), (g) and (h) are true.

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

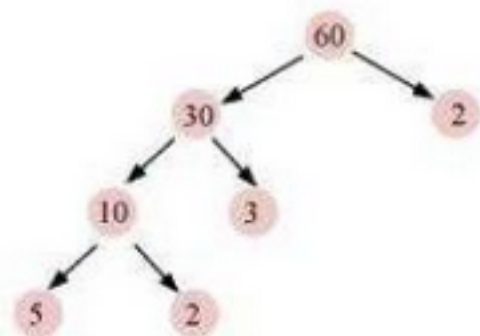


Answer:

(a) As  $6 = 2 \times 3$  and  $10 = 5 \times 2$



(b) As  $60 = 30 \times 2$ ,  $30 = 10 \times 3$ , and  $10 = 5 \times 2$



**Question 3:** Which factors are not included in the prime factorization of a composite number?

Answer: 1 is the factor which is not included in the prime factorization of a composite number.

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

Answer: The greatest 4-digit number = 9999, The prime factors of 9999 are  $3 \times 3 \times 11 \times 101$ .

**Question 5:** Write the smallest 5-digit number and express it in terms of its prime factors.

Answer: The smallest five digit number is 10000. The prime factors of 10000 are  $2 \times 2 \times 2 \times 2 \times 5 \times 5 \times 5 \times 5$ .

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

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Answer: Prime factors of 1729 are  $7 \times 13 \times 19$ . The difference of two consecutive prime factors is 6.

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

Answer: Among the three consecutive numbers, there must be one even number and one multiple of 3. Thus, the product must be multiple of 6.

Example: (i)  $2 \times 3 \times 4 = 24$  (ii)  $4 \times 5 \times 6 = 120$

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

Answer:  $3 + 5 = 8$  and 8 is divisible by 4.

$5 + 7 = 12$  and 12 is divisible by 4.  $7 + 9 = 16$  and 16 is divisible by 4.  $9 + 11 = 20$  and 20 is divisible by 4.

**Question 9:** In which of the following expressions, prime factorization has been done:

(a)  $24 = 2 \times 3 \times 4$  (b)  $56 = 7 \times 2 \times 2 \times 2$  (c)  $70 = 2 \times 5 \times 7$  (d)  $54 = 2 \times 3 \times 9$

Answer: In expressions (b) and (c), prime factorization has been done.

**Question 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: The prime factorization of  $45 = 5 \times 9$

25110 is divisible by 5 as '0' is at its unit place.

25110 is divisible by 9 as sum of digits is divisible by 9. Therefore, the number must be divisible by  $5 \times 9 = 45$

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

Answer: No. Number 12 is divisible by both 6 and 4 but 12 is not divisible by 24.

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

Answer: The smallest four prime numbers are 2, 3, 5 and 7. Hence, the required number is  $2 \times 3 \times 5 \times 7 = 210$