Real Numbers: Chapter Introduction

Break 360 down and only primes are left, the same ones whichever way you break it. The Fundamental Theorem of Arithmetic, HCF and LCM, and why √2 is irrational.

Name: Date: Score: ____ / 19

A. Fill in the blanks

1. Every composite number can be expressed as a product of ____.

2. The prime factorisation of 360 is $2^3 \times 3^2 \times$ ____.

3. HCF of 12 and 18 is ____.

4. LCM of 12 and 18 is ____.

5. A number that cannot be written as p/q is called ____.

B. True or False

6. The prime factorisation of a number is unique apart from order. True / False

7. √2 is a rational number. True / False

8. HCF × LCM equals the product of two numbers. True / False

9. 1 is a prime number. True / False

C. Assertion and reason

10. Assertion (A): 360 = $2^3 \times 3^2 \times 5$ however you factorise it.
Reason (R): Prime factorisation of a composite number is unique.

(a) Both A and R are true, and R explains A
(b) Both A and R are true, but R does not explain A
(c) A is true, R is false
(d) A is false, R is true

Answer: _____

11. Assertion (A): √2 is irrational.
Reason (R): √2 cannot be written as p/q with integers p, q ($q \neq 0$).

(a) Both A and R are true, and R explains A
(b) Both A and R are true, but R does not explain A
(c) A is true, R is false
(d) A is false, R is true

Answer: _____

D. Choose the correct option

12. HCF of $2^3 \times 3$ and 2×3^2 is:

(a) 2
(b) 3
(c) 6
(d) 18

Answer: _____

13. LCM of 8 and 12 is:

(a) 4 (b) 24

(c) 48 (d) 96

Answer: _____

14. Which is irrational?

(a) $\sqrt{9}$ (b) 0.5

(c) $\sqrt{3}$ (d) 7/2

Answer: _____

15. The prime factorisation of 140 is:

(a) $2^2 \times 5 \times 7$ (b) 2×70

(c) 4×35 (d) $2^2 \times 35$

Answer: _____

E. Numerical problems

16. Find the HCF and LCM of 24 and 36 by prime factorisation.

17. The HCF of two numbers is 9 and their product is 1620. Find their LCM.

F. Short answer questions

18. State the Fundamental Theorem of Arithmetic.

G. Match the columns

19. Match each item in Column A with the correct item in Column B.

Column A	Column B	Your answer
1. $2^3 \times 3^2 \times 5$	(a) 18	1 → ____
2. $2^2 \times 3$	(b) 360	2 → ____
3. 2×3^2	(c) Irrational	3 → ____
4. $\sqrt{2}$	(d) 12	4 → ____

Detailed solutions

1. primes

2. 5

3. 6

4. 36

5. irrational

6. True. Fundamental Theorem of Arithmetic.

7. False. It cannot be written as p/q.

8. True. 6 × 36 = 216 = 12 × 18.

9. False. A prime has exactly two factors; 1 has only one.

10. (a) R explains A.

11. (a) R explains A.

12. (c) 6. Smallest powers of common primes: 2 × 3.

13. (b) 24. $2^3 \times 3 = 24$.

14. (c) √3. √3 cannot be written as p/q.

15. (a) $2^2 \times 5 \times 7$. 140 = 2 × 2 × 5 × 7.

16. 24 = $2^3 \times 3$; 36 = $2^2 \times 3^2$; HCF = $2^2 \times 3$; LCM = $2^3 \times 3^2$. **Answer: HCF 12, LCM 72**

17. LCM = product ÷ HCF = 1620 ÷ 9. **Answer: 180**

18. Every composite number can be expressed as a product of primes, and this factorisation is unique apart from the order of the prime factors.

19. 1 → (b), 2 → (d), 3 → (a), 4 → (c). Each item matches its value or type.