

CHAPTER – 3

Playing with Numbers

EXERCISE – 3.6

Q. 1

Find the HCF of the following numbers:

- (a) 18, 48 (b) 30, 42
(c) 18, 60 (d) 27, 63
(e) 36, 84 (f) 34, 102
(g) 70, 105, 175
(h) 91, 112, 49 (i) 18, 54, 81
(j) 12, 45, 75

Answer:

HCF – Highest common factor

The highest common factor of two or more numbers is the largest number that divides separately both the numbers.

a. 18 and 48,

2		18
<hr/>		
3		9
<hr/>		
3		3
<hr/>		
		1

2		48
<hr/>		
2		24
<hr/>		
2		12
<hr/>		
2		6
<hr/>		
3		3
<hr/>		
		1

$$18 = 2 \times 3 \times 3$$

$$48 = 2 \times 2 \times 2 \times 2 \times 3$$

$$\text{HCF} = 2 \times 3 = 6$$

b. 30, 42

$$\begin{array}{r|l} 2 & 30 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 42 \\ \hline 3 & 21 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$30 = 2 \times 3 \times 5$$

$$42 = 2 \times 3 \times 7$$

$$\text{HCF} = 2 \times 3 = 6$$

c. 18, 60

$$\begin{array}{r|l} 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 60 \\ \hline 2 & 30 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$18 = 2 \times 3 \times 3$$

$$60 = 2 \times 2 \times 3 \times 5$$

$$\text{HCF} = 2 \times 3 = 6$$

d. 27, 63

$$\begin{array}{r|l} 3 & 27 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 3 & 63 \\ \hline 3 & 21 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$27 = 3 \times 3 \times 3$$

$$63 = 3 \times 3 \times 7$$

$$\text{HCF} = 3 \times 3 = 9$$

e. 36, 84

$$\begin{array}{r|l} 2 & 36 \\ \hline 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 84 \\ \hline 2 & 42 \\ \hline 3 & 21 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$36 = 2 \times 2 \times 3 \times 3$$

$$84 = 2 \times 2 \times 3 \times 7$$

$$\text{HCF} = 2 \times 2 \times 3 = 12$$

f. 34, 102

$$\begin{array}{r|l} 2 & 34 \\ \hline 17 & 17 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 102 \\ \hline 3 & 51 \\ \hline 17 & 17 \\ \hline & 1 \end{array}$$

$$34 = 2 \times 17$$

$$102 = 2 \times 3 \times 17$$

$$\text{HCF} = 2 \times 17 = 34$$

g. 70, 105, 175

$$\begin{array}{r|l} 2 & 70 \\ \hline 5 & 35 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 3 & 105 \\ \hline 5 & 35 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 5 & 175 \\ \hline 5 & 35 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$70 = 2 \times 5 \times 7$$

$$105 = 3 \times 5 \times 7$$

$$175 = 5 \times 5 \times 7$$

$$\text{HCF} = 5 \times 7 = 35$$

h. 91, 112, 49

$$\begin{array}{r|l} 7 & 91 \\ \hline 13 & 13 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 112 \\ \hline 2 & 56 \\ \hline 2 & 28 \\ \hline 2 & 14 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 7 & 49 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$91 = 7 \times 13$$

$$112 = 2 \times 2 \times 2 \times 2 \times 7$$

$$49 = 7 \times 7$$

$$\text{HCF} = 7$$

i. 18, 54, 81

$$\begin{array}{r|l} 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 54 \\ \hline 3 & 27 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 3 & 81 \\ \hline 3 & 27 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$18 = 2 \times 3 \times 3$$

$$54 = 2 \times 3 \times 3 \times 3$$

$$81 = 3 \times 3 \times 3 \times 3$$

$$\text{HCF} = 3 \times 3 = 9$$

j. 12, 45, 75

$$\begin{array}{r|l} 2 & 12 \\ \hline 2 & 6 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 3 & 45 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 3 & 75 \\ \hline 5 & 25 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$12 = 2 \times 2 \times 3$$

$$45 = 3 \times 3 \times 5$$

$$75 = 3 \times 5 \times 5$$

$$\text{HCF} = 3$$

Q. 2

What is the HCF of two consecutive-

(a) numbers?

(b) even numbers?

(c) odd numbers?

Answer:

a. Consecutive numbers

Example- 2 and 3

HCF = 1

b. Even number

Example – 2 and 4

HCF = 2

c. Odd numbers

Example – 3 and 5

HCF = 1

Q. 3

HCF of co-prime numbers 4 and 15 was found as follows by factorization: $4 = 2 \times 2$ and $15 = 3 \times 5$ since there is no common prime factor. So, HCF of 4 and 15 is 0. Is the answer correct? If not, what is the correct HCF?

Answer:

No, the answer is not correct. 1 will be the correct HCF.

Explanation: The factorization of 4 and 15 is given as:

4: $1 \times 2 \times 2$

15: $1 \times 3 \times 5$

Here, the highest common factor is 1.