

Exercise 2.11

Q.1 For each of the following pairs of numbers, verify the property:

Product of Numbers = Product of their HCF and LCM

(i) 25, 65

(ii) 117, 221

(iii) 35, 40

(iv) 87, 145

(v) 490, 155

Solution: (i) $25 = 5 \times 5$

$65 = 5 \times 13$

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

$$\begin{array}{r|l} 5 & 65 \\ \hline 13 & 13 \\ \hline & 1 \end{array}$$

$\therefore \text{HCF} = 5$

$\text{LCM} = 5 \times 5 \times 13 = 325$

here $\text{HCF} \times \text{LCM} = 5 \times 325 = 1625$

also Product of numbers = $25 \times 65 = 1625$

hence verified.

(ii) 117, 221

$117 = 3 \times 3 \times 13$

$221 = 13 \times 17$

$$\begin{array}{r|l} 3 & 117 \\ \hline 3 & 39 \\ \hline & 13 \end{array}$$

$$\begin{array}{r|l} 13 & 221 \\ \hline 17 & 17 \\ \hline & 1 \end{array}$$

$\therefore \text{HCF} = 13$

$\text{LCM} = 3 \times 3 \times 13 \times 17 = 1989$

Now $\text{LCM} \times \text{HCF} = 13 \times 1989 = 25857$

Product of numbers = $117 \times 221 = 25857$

hence verified

(iii) 35, 40, here $35 = 5 \times 7$
 $40 = 2 \times 2 \times 2 \times 5$

5		35
		7

2		40
2		20
2		10
		5

$$\therefore \text{HCF} = 5$$

$$\text{LCM} = 2 \times 2 \times 2 \times 5 \times 7 = 280$$

Now $\text{HCF} \times \text{LCM} = 5 \times 280 = 1400$

$$\therefore \text{Product of Numbers} = 35 \times 40 = 1400$$

hence verified.

(iv) 87, 145

$$\therefore 87 = 3 \times 29$$

$$145 = 5 \times 29$$

3		87
		29

5		145
		29

$$\therefore \text{HCF} = 29$$

$$\text{LCM} = 3 \times 5 \times 29 = 435$$

here, $\text{LCM} \times \text{HCF} = 435 \times 29 = 12615$

$$\text{Product of Numbers} = 87 \times 145 = 12615$$

Hence Verified.

(v) 490, 1155

$$490 = 2 \times 5 \times 7 \times 7$$

$$1155 = 3 \times 5 \times 7 \times 11$$

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

$$\text{LCM} = 2 \times 3 \times 5 \times 7 \times 7 \times 11 = \cancel{16170} 16170$$

here $\text{LCM} \times \text{HCF} = 35 \times 16170 = 565950$

2		490
5		245
7		49
7		7
		1

3		1155
5		385
7		77
11		11
		1

also, Product of numbers = $490 \times 1155 = 565950$

Q.2 Find HCF and LCM of following pair of numbers.

(i) 117, 221 (ii) 234, 572 (iii) 145, 232

(iv) 861, 1353

Solution (i) 117, 221

$$\therefore 117 = 3 \times 3 \times 13$$

$$221 = 13 \times 17$$

$$\begin{array}{r|l} 3 & 117 \\ \hline 3 & 39 \\ \hline 13 & 13 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 13 & 221 \\ \hline 17 & 17 \\ \hline & 1 \end{array}$$

$$\therefore \text{HCF} = 13$$

$$\text{LCM} = 3 \times 3 \times 13 \times 17 = 1989$$

(ii) 234, 572

$$\therefore 234 = 2 \times 3 \times 3 \times 13$$

$$572 = 2 \times 2 \times 11 \times 13$$

$$\begin{array}{r|l} 2 & 234 \\ \hline 3 & 117 \\ \hline 3 & 39 \\ \hline 13 & 13 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 572 \\ \hline 2 & 286 \\ \hline 11 & 143 \\ \hline 13 & 13 \\ \hline & 1 \end{array}$$

$$\therefore \text{HCF} = 2 \times 13 = 26$$

$$\text{LCM} = 2 \times 2 \times 3 \times 3 \times 11 \times 13 = 5148$$

(iii) 145, 232

$$\text{here, } 145 = 5 \times 29$$

$$232 = 2 \times 2 \times 2 \times 29$$

$$\begin{array}{r|l} 5 & 145 \\ \hline 29 & 29 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 232 \\ \hline 2 & 116 \\ \hline 2 & 58 \\ \hline 29 & 29 \\ \hline & 1 \end{array}$$

$$\text{HCF} = 29$$

$$\text{LCM} = 2 \times 2 \times 2 \times 5 \times 29 = 1160$$

(iv) 861, 1353

$$\text{here, } 861 = 3 \times 7 \times 41$$

$$1353 = 3 \times 11 \times 41$$

$$\therefore \text{HCF} = 3 \times 41 = 123$$

$$\text{LCM} = 3 \times 7 \times 11 \times 41 = 9471$$

$$\begin{array}{r|l} 3 & 861 \\ \hline 7 & 287 \\ \hline 41 & 41 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 3 & 1353 \\ \hline 11 & 451 \\ \hline 41 & 41 \\ \hline & 1 \end{array}$$

Q3 The LCM and HCF of two numbers are 180 and 6 respectively. If one of the numbers is 30, find the other number.

Solution: We are given that

$$\text{LCM} = 180, \text{HCF} = 6$$

$$\text{one number} = 30$$

$$\text{As, } \text{LCM} \times \text{HCF} = \text{Product of numbers.}$$

$$\Rightarrow 180 \times 6 = 30 \times \text{other number}$$

$$\Rightarrow \text{other number} = \frac{180 \times 6}{30} = \frac{1080}{30} = 36$$

$$\therefore \text{required number} = 36$$

Q.4 The HCF of two numbers is 16 and their product is 3072. Find their LCM.

Sol: It is given that, $\text{Product of numbers} = 3072$
~~HCF~~ = HCF = 16

$$\therefore \text{LCM} = \frac{\text{Product of numbers}}{\text{HCF}}$$

$$= \frac{3072}{16} = 192$$

$\therefore$ LCM of two numbers is 192.

Q.5 The HCF of two numbers is 145, their LCM is 2175. If one number is 725, find the other.

Sol: As we know that

$$\text{LCM} \times \text{HCF} = \text{Product of numbers}$$

$$\Rightarrow 2175 \times 145 = 725 \times \text{other number}$$

$$\Rightarrow \text{other number} = \frac{2175 \times 145}{725}$$

$$= 435$$

Q.6 Can two numbers have 16 as their HCF and 380 as their LCM. Give reason.

Solution, As, HCF of two number must divide their LCM,

here $\frac{380}{16}$ is not completely divisible.

hence, two numbers of such conditions are not possible.