

## EXERCISE 8(B)

### Question 1.

Using the common factor method, find the H.C.F. of :

(i) 16 and 35

(ii) 25 and 20

(iii) 27 and 75

(iv) 8, 12 and 18

(v) 24, 36, 45 and 60

### Solution:

(i)  $F_{16} = 1, 2, 4, 8, 16$

$F_{35} = 1, 5, 7, 35$

Common factors between 16 and 35 = 1

H.C.F. of 16 and 35 = 1

(ii)  $F_{25} = 1, 5, 25$

$F_{20} = 1, 2, 4, 5, 10, 20$

Common factors between 25 and 20 = 1, 5

H.C.F. of 25 and 20 = 5

(iii)  $F_{27} = 1, 3, 9, 27$

$F_{75} = 1, 3, 5, 15, 25, 75$

Common factors between 27 and 75 = 1, 3

H.C.F. of 27 and 75 = 3

(iv)  $F_8 = 1, 2, 4, 8$

$F_{12} = 1, 2, 3, 4, 6, 12$

$F_{18} = 1, 2, 3, 6, 9, 18$

Common factors between 8, 12 and 18 = 1, 2

H.C.F. of 8, 12 and 18 = 2

(v)  $F_{24} = 1, 2, 3, 4, 6, 8, 12, 24$

$F_{36} = 1, 2, 3, 4, 6, 12, 18, 36$

$F_{45} = 1, 3, 5, 9, 15, 45$

$F_{60} = 1, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60$   
Common factor between 24, 36, 45 and 60 = 1, 3  
H.C.F. of 24, 36, 45 and 60 = 3

**Question 2.**

Using the prime factor method, find the H.C.F. of:

- (i) 5 and 8
- (ii) 24 and 49
- (iii) 40, 60 and 80
- (iv) 48, 84 and 88
- (v) 12, 16 and 28

**Solution:**

(i) Prime factor of 5 = 5

Prime factor of 8 =  $2 \times 2 \times 2$

No common prime factor

H.C.F. of 5 and 8 = 1

(as both the number are co-prime)

(ii) Prime factor of 24 =  $2 \times 2 \times 2 \times 3$

Prime factor of 49 =  $7 \times 7$

No common prime factor, number are co-prime.

H.C.F. of 24 and 49 = 1.

(iii) Prime factor of 40 =  $2 \times 2 \times 2 \times 5$

Prime factor of 60 =  $2 \times 2 \times 3 \times 5$

Prime factor of 80 =  $2 \times 2 \times 2 \times 2 \times 5$

Common prime factor =  $2 \times 2 \times 5$

H.C.F. of 40, 60 and 80 =  $2 \times 2 \times 5 = 20$

(iv) Prime factor of 48 =  $2 \times 2 \times 2 \times 2 \times 3$

Prime factor of 84 =  $2 \times 2 \times 3 \times 7$

Prime factor of 88 =  $2 \times 2 \times 2 \times 11$

Common prime factor of 48, 84 and 88 =  $2 \times 2$

H.C.F. of 48, 84 and 88 =  $2 \times 2 = 4$

(v) Prime factor of 12 =  $2 \times 2 \times 3$

Prime factor of 16 =  $2 \times 2 \times 2 \times 2$

Prime factor of 28 =  $2 \times 2 \times 7$

Common prime factor between 12, 16 and 28 =  $2 \times 2$

H.C.F. of 12, 16 and 28 =  $2 \times 2 = 4$

**Question 3.**

Using the division method, find the H.C.F. of the following :

- (i) 16 and 24
- (ii) 18 and 30
- (iii) 7, 14 and 24
- (iv) 70, 80, 120 and 150
- (v) 32, 56 and 46

**Solution:**

(i) 16 and 24

$$\begin{array}{r} 16 \overline{) 24} ( 1 \\ \underline{16} \\ 8 \overline{) 16} ( 2 \\ \underline{16} \\ \times \end{array}$$

Since last division is 8

$\therefore$  H.C.F. of 16 and 24 = 8

(ii) 18 and 30

$$\begin{array}{r} 18 \overline{) 30} ( 1 \\ \underline{18} \\ 12 \overline{) 18} ( 1 \\ \underline{12} \\ 6 \overline{) 12} ( 2 \\ \underline{12} \\ \times \end{array}$$

Since last division is 6

$\therefore$  H.C.F. of 18 and 30 = 6

(iii) 7, 14 and 24

$$\begin{array}{r} 7 \overline{) 14} ( 2 \\ \underline{14} \\ \times \\ 7 \overline{) 24} ( 3 \\ \underline{21} \\ 3 \overline{) 7} ( 2 \\ \underline{6} \\ 1 \overline{) 3} ( 3 \\ \underline{3} \\ \times \end{array}$$

Since the last division is 1

$\therefore$  H.C.F. of 7, 14 and 24 = 1

myclass24  
Your Class. Your Pace.

(iv) 70, 80, 120 and 150

$$\begin{array}{r} 70 \overline{) 80} ( 1 \\ \underline{70} \\ 10 \overline{) 70} ( 7 \\ \underline{70} \\ \underline{\times} \\ 10 \overline{) 120} ( 12 \\ \underline{120} \\ \underline{\times} \\ 10 \overline{) 150} ( 15 \\ \underline{150} \\ \underline{\times} \end{array}$$

Since the last division = 10

$\therefore$  H.C.F. of 70, 80, 120 and 150 = 10

(v) 32, 56 and 46

$$\begin{array}{r} 32 \overline{) 56} ( 1 \\ \underline{32} \\ 24 \overline{) 32} ( 1 \\ \underline{24} \\ 8 \overline{) 24} ( 3 \\ \underline{24} \\ \underline{\times} \\ 8 \overline{) 46} ( 5 \\ \underline{40} \\ 6 \overline{) 8} ( 1 \\ \underline{6} \\ 2 \overline{) 6} ( 3 \\ \underline{6} \\ \underline{\times} \end{array}$$

Since last division = 2

$\therefore$  H.C.F. of 32, 56 and 46 = 2

#### Question 4.

Use a method of your own choice to find the H.C.F. of :

(i) 45, 75 and 135

(ii) 48, 36 and 96

(iii) 66, 33 and 132

(iv) 24, 36, 60 and 132

(v) 30, 60, 90 and 105

**Solution:**

(i) Factor of 45 =  $F_{45} = 3 \times 3 \times 5$

Factor of 75 =  $F_{75} = 3 \times 5 \times 5$

and Factor of 135 =  $F_{135} = 3 \times 3 \times 3 \times 5$

Now the common factors of 45, 75 and 135 = 3 and 5

H.C.F. =  $3 \times 5 = 15$

(ii) Factor of 48 =  $F_{48} = 2 \times 2 \times 2 \times 2 \times 3$

Factor of 36 =  $F_{36} = 2 \times 2 \times 3 \times 3$

and factor of 96 =  $2 \times 2 \times 2 \times 2 \times 2 \times 3$

Now the common factor of 48, 36 and 96 = 2, 2 and 3

H.C.F. =  $2 \times 2 \times 3 = 12$

(iii) Factor of 66 =  $F_{66} = 2 \times 3 \times 11$

Factor of 33 =  $F_{33} = 3 \times 11$

and factor of 132 =  $F_{132} = 2 \times 2 \times 3 \times 11$

Now the common factor of 66, 33 and 132 = 3 and 11

H.C.F. =  $3 \times 11 = 33$

(iv) Factor of 24 =  $F_{24} = 2 \times 2 \times 2 \times 3$

Factor of 36 =  $F_{36} = 2 \times 2 \times 3 \times 3$

Factor of 60 =  $F_{60} = 2 \times 2 \times 3 \times 5$

and Factor of 132 =  $F_{132} = 2 \times 2 \times 3 \times 11$

Now the common factors of 24, 36, 60 and 132 = 2, 2 and 3

H.C.F. =  $2 \times 2 \times 3 = 12$

(v) Factor of 30 =  $F_{30} = 2 \times 3 \times 5$

Factor of 60 =  $F_{60} = 2 \times 2 \times 3 \times 5$

Factor of 90 =  $F_{90} = 2 \times 3 \times 3 \times 5$

and factor of 105 =  $F_{105} = 3 \times 5 \times 7$

Now the common factor of 30, 60, 90 and 105 = 3 and 5

H.C.F. =  $3 \times 5 = 15$

### Question 5.

Find the greatest number that divides each of 180, 225 and 315 completely.

#### Solution:

The greatest number that divides 180, 225 and 315 will be HCF of 180, 225, 315

Let us first find HCF of 180 and 225

$$\begin{array}{r} 180 \overline{)225} 1 \\ \underline{180} \\ 45 \end{array}$$
$$\begin{array}{r} 45 \overline{)180} 4 \\ \underline{180} \\ \times \end{array}$$

Since third number is 315, and HCF obtained above is 45, find the HCF of 315 and 45.

$$\begin{array}{r} 45 \overline{)315} 7 \\ \underline{315} \\ \times \end{array}$$

∴ HCF of given number 80, 225 and 315  
= 45

**Question 6.**

Show that 45 and 56 are co-prime numbers.

**Solution:**

The HCF of two co-prime numbers is always HCF of 45 and 56

$$\begin{array}{r} 45 \overline{)56} 1 \\ \underline{45} \\ 11 \end{array}$$
$$\begin{array}{r} 11 \overline{)45} 4 \\ \underline{44} \\ 1 \end{array}$$
$$\begin{array}{r} 1 \overline{)11} 11 \\ \underline{11} \\ \times \end{array}$$

From above it is proved that HCF of 45 and 56 is 1

Hence 45 and 56 are co-prime numbers.

**Question 7.**

Out of 15, 16, 21 and 28, find out all the pairs of co-prime numbers.

**Solution:**

The pair will be 15 – 16, 16–21, 21–28,  
15–28 and 16–28.

The HCF of 15 and 16

$$\begin{array}{r} 15 \overline{)16} (1 \\ \underline{15} \\ 1 \end{array}$$

and HCF of 21 and 28

HCF of 16 and 21

HCF of 13, 28

$$\begin{array}{r} 16 \overline{)21} (1 \\ \underline{16} \\ 5 \end{array}$$

$$\begin{array}{r} 15 \overline{)28} (1 \\ \underline{15} \\ 13 \end{array}$$

HCF of 16, 28

$$\begin{array}{r} 13 \overline{)15} (1 \\ \underline{13} \\ 2 \end{array}$$

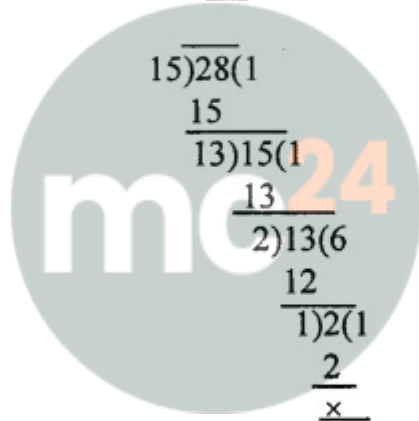
From above it is clear that 15 and 16 are co-prime because common factor is 1  
Hence pairs 15 and 16, 16, 21, 15, 28 are co-prime number.

**Question 8.**

Find the greatest no. that will divide 93, 111 and 129, leaving remainder 3 in each case.

**Solution:**

Since Remainder is 3 in each case numbers are



$$93 - 3 = 90$$

$$111 - 3 = 108$$

$$129 - 3 = 126$$

Required number will be HCF of 90, 108 and 126 HCF of 90 and 108

$$\begin{array}{r} 90 \overline{)108} 1 \\ \underline{90} \phantom{0} \\ 18 \phantom{0} \end{array}$$

$$\begin{array}{r} 90 \\ \underline{18} 90 5 \\ \phantom{0} \end{array}$$

$$\begin{array}{r} 90 \\ \underline{\phantom{0} \times} \end{array}$$

HCF of 18 and 126

$$\begin{array}{r} 18 \overline{)126} 7 \\ \underline{126} \\ \phantom{0} \times \end{array}$$

$\therefore$  Greatest number will be = 18

**mc24 Myclass24**  
Your Class. Your Pace.