H.W
25.6.21

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Exercise 8(B)

1. Using the commonfactor method, find the HCF of:

i) 16 and 35

Ans- Common factors of 16 and 35 are as follows:
F(16) = 1, 2, 4, 8, 16
F(35) = 1, 5, 7, 35
The common factors between 16 and 35 = 1
∴ the HCF of 16 and 35 = 1

ii) 25 and 20

Ans- Common factors of 25 and 20 are as follows:
F (25) = 1, 5, 25
F(20) = 1, 2, 4, 5, 10, 20
The common factors between 25 and 20 = 1, 5
∴ The HCF of 25 and 20 = 5

iii) 27 and 75

Ans- Common factors between 27 and 75 are as follows:
F (27) = 1, 3, 9, 27
F(75) = 1, 3, 5, 15 25, 75
The common factors between 27 and 75 = 1, 3
∴ HCF of 27 and 75 = 3

iv) 8, 12 and 18

Ans- Common factors between 8, 12 and 18 are as follows:
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
∴ The HCF of 8, 12 and 18 = 2

v) 24, 36, 45 and 60

Ans- Common factor between 24, 36, 45 and 60 are as follows:
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 factors between 24, 36, 45 and 60 = 1, 3
∴ HCF of 24, 36, 45 and 60 = 3

2. Using the prime factor method, find the HCF of:

i) 5 and 8

Ans- The prime factors of 5 and 8 are as follows:
$P_5 = 5$
$P_8 = 2 \times 2 \times 2$
No, common prime factors between 5 and 8
Hence, HCF of 5 and 8 = 1

ii) 24 and 49

Ans- The prime factors of 24 and 49 are as follows:
$P_{24} = 2 \times 2 \times 2 \times 3$
$P_{49} = 7 \times 7$
No common prime factors between 24 and 49
Hence, HCF of 24 and 49 = 1

iii) 40, 60 and 80

Ans- The prime factors of 40, 60 and 80 are as follows:
$P_{40} = 2 \times 2 \times 2 \times 5$
$P_{60} = 2 \times 2 \times 3 \times 5$
$P_{80} = 2 \times 2 \times 2 \times 2 \times 5$
Prime factors between 40, 60 and 80 = 2 × 2 × 5
So, HCF of 40, 60 and 80 = 2 × 2 × 5
= 20

iv) 48, 84 and 88

Ans- The prime factors of 48, 84 and 88 are as follows:
$P_{48} = 2 \times 2 \times 2 \times 2 \times 3$
$P_{84} = 2 \times 2 \times 3 \times 7$
$P_{88} = 2 \times 2 \times 2 \times 11$
Prime factors between 48, 84 and 88 = 2 × 2
∴ HCF of 48, 84 and 88 = 2 × 2 = 4

v) 12, 16 and 28

Ans- $P_{12} = 2 \times 2 \times 3$

$P_{16} = 2 \times 2 \times 2$

$P_{28} = 2 \times 2 \times 7$

Prime factors between 12, 16 and 28 = 2 × 2

∴ HCF of 12, 16 and 28 = 2 × 2 = 4

3. Using the division method, find the HCF of the following:

i) 16 and 24

Ans- Using division method, we get

```
16 | 24 | 1
   -16
    8 | 16 | 2
      -16
       0
```

Here, the last divisor is 8

Hence, HCF of 16 and 24 is 8

ii) 18 and 30

Ans- Using division method, we get

```
18 | 30 | 1
   -18
   12 | 18 | 1
      -12
       6 | 12 | 2
         -12
          0
```

Here, the last divisor is 6

Hence, the HCF of 18 and 30 is 6

(vii) 7, 14 and 24

Ans- Using division method we get
HCF of 7 and 14

```
7 | 14 | 2
  -14
    0
```

Here the divisor is 7
So, the HCF of 7 and 14 is 7
HCF of 7, 14 and 24 = HCF of 7 and 24

```
7 | 24 | 3
  -21
    3 | 7 | 2
      -6
        1 | 3 | 3
          -3
            0
```

Here the last divisor is 1
So, the HCF of 7 and 24 is 1
∴ The HCF of 7, 14 and 24 is 1

iv) 70, 80, 120 and 150

Ans- Using division method we get

HCF of 70 and 80

$$\begin{array}{r|l|l} 70 & 80 & 1 \\ & -70 & \\ \hline 10 & 70 & 7 \\ & -70 & \\ \hline & 0 & \end{array}$$

Here the last divisior is 10

∴ The HCF of 70 and 80 is 10

HCF of 10 and 120

$$\begin{array}{r|l|l} 10 & 120 & 12 \\ & -10 & \\ \hline & 20 & \\ & -20 & \\ \hline & 0 & \end{array}$$

Here the divisor is 10

∴ The HCF of 10 and 120 is 10

HCF of 70, 80, 120 and 150 = HCF of 10 and 150

$$\begin{array}{r|l|l} 10 & 150 & 15 \\ & -10 & \\ \hline & 50 & \\ & -50 & \\ \hline & 0 & \end{array}$$

Here the divisior is 10

So, the HCF of 10 and 150 is 10

∴ Required HCF of 70, 80, 120 and 150 is 10

v) 32, 56 and 46

Ans- Using division method we get
HCF of 32 and 56

32	56	1
	32	
24	32	1
	24	
8	24	3
	24	
	0	

Here the last divisor is 8
∴ The HCF of 32 and 56 is 8
HCF of 32, 56 and 46 = HCF of 8 and 46

8	46	5
	40	
6	8	1
	6	
2	6	3
	6	
	0	

Here the last divisor is 2
So, the HCF of 8 and 46 is 2

∴ Required HCF of ~~38 and 46~~ 32, 56 and 46 is 2

4. Use a method of your own choice to find the HCF of :

i) 45, 75 and 135

Ans- Prime factorisation Method :

$P_{45} = 3 \times 3 \times 5$

$P_{75} = 3 \times 5 \times 5$

$P_{135} = 3 \times 3 \times 3 \times 5$

The common factors of 45, 75 and 135 = 3×5

∴ HCF of 45, 75 and 135 = 15

ii) 48, 36 and 96

Ans- Prime factorisation Method :

$P_{48} = 2 \times 2 \times 2 \times 2 \times 3$

$P_{36} = 2 \times 2 \times 3 \times 3$

$P_{96} = 2 \times 2 \times 2 \times 2 \times 2 \times 3$

The common factors of 48, 36 and 96 = $2 \times 2 \times 3$

∴ HCF of 48, 36, 96 = 12

iii) 66, 33 and 132

Ans- Prime factorisation Method :

$P_{66} = 2 \times 3 \times 11$

$P_{33} = 3 \times 11$

$P_{132} = 2 \times 2 \times 3 \times 11$

The common factors of 66, 33 and 132 = 12×3

∴ HCF of 66, 33 and 132 = 33

iv) 24, 36, 60 and 132

Ans- Prime factorisation Method :

$P_{24} = 2 \times 2 \times 2 \times 3$

$P_{36} = 2 \times 2 \times 3 \times 3$

$P_{60} = 2 \times 2 \times 3 \times 5$

$P_{132} = 2 \times 2 \times 3 \times 11$

The common factors of 24, 36, 60 and 132 is = $2 \times 2 \times 3$

∴ HCF of 24, 36, 60 and 132 = 12

v) 30, 60, 90 and 105

Ans: Prime factorisation Method

$P_{30} = 2 \times 3 \times 5$

$P_{60} = 2 \times 2 \times 3 \times 5$

$P_{90} = 2 \times 3 \times 3 \times 5$

$P_{105} = 3 \times 5 \times 7$

The Common factors of 30, 60, 90 and 105 is 3×5

∴ HCF of 30, 60, 90 and 105 is 15

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

Ans- The greatest number that divides each of 180, 225 and 315 will be the HCF of 180, 225 and 315.

Using division method, the HCF of 180, 225 and 315 are-

HCF of 180 and 225

```
180 | 225 | 1
    | 180
    |-----
     45 | 180 | 4
        | 180
        |-----
          0
```

HCF of 180 and 225 = 45

HCF of 180, 225 and 315 = HCF of 45 and 315

```
45 | 315 | 7
   | 315
   |-----
     0
```

The divisor is 45

HCF of 45 and 315 = 45.

∴ Required HCF of 180, 225 and 315 is 45

So, The greatest number that divides each of 180, 225 and 315 completely is 45.

6. Show that 45 and 56 are Coprime numbers.

Ans- 45 and 56 are Coprime numbers as -

F45 = 1, 3, 5, 9, 15 and 45

F56 = 1, 2, 4, 7, 8, 14, 28 and 56

45 and 56 have no comonon factor other than 1.

∴ 45 and 56 are Co-prime numbers.

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

Ans- The factors of 15, 16, 21 and 28 are -

15 - 1, 3, 5, 15

16 - 1, 2, 4, 8, 16

21 - 1, 3, 7, 21

28 - 1, 2, 4, 7, 14, 28

The pairs of Co-prime numbers are -

i) 15 and 16

15 and 16 have no Common factor Other than 1.

∴ 15 and 16 are Co-prime numbers

ii) 16 and 21

16 and 21 have no common factor Other than 1

∴ 15 and 16 are Co-prime numbers

iii) 15 and 28

15 and 28 have no Common factor other that 1

∴ 15 and 28 are Co-prime numbers

So, Out of 15, 16, 21 and 28, the pairs of Co-prime numbers are - 15 and 16, 16 and 21, and 15 and 28.

8. Find the greatest number that will divide 93, 111 and 129, leaving remainder 3 in each case.

Ans- First, decrease the leaving remainder 3 from the numbers 93, 111 and 129 to find the required number.

$93 - 3 = 90$

$111 - 3 = 108$

$129 - 3 = 126$

In each case, the HCF of 90, 108 and 126 will be the greatest number that will divide 93, 111 and 129 leaving remainder 3

Using division method, the HCF of 90, 108 and 126 is given below

HCF of 90 and 108

$$\begin{array}{r|l|l} 90 & 108 & 1 \\ & 90 & \\ \hline 18 & 90 & 5 \\ & 90 & \\ \hline & 0 & \end{array}$$

Here the last divisor is 18

∴ HCF of 90 and 108 is 18

HCF of 90, 108 and 126 = HCF of 18 and 126

$$\begin{array}{r|l|l} 18 & 126 & 7 \\ & 126 & \\ \hline & 0 & \end{array}$$

Here the divisor is 18

∴ HCF of 18 and 126 is 18

∴ Required HCF of 90, 108, 126 is 18

So, The greatest number that will divide 93, 111 and 129 leaving remainder 3 in each case is 18.