Highest COMMON FACTOR:
Exercise 8(B)

Q1) 16, 35

Factors of 16 = 1, 2, 4, 8, 16
Factors of 35 = 1, 5, 7, 35.
Common factors = 1, HCF = 1.

iii) 27, 75

Factors of 27 → 1, 3, 9, 27
Factors of 75 → 1, 3, 5, 15, 25, 75
Common factors = 1 and 3, HCF = 3.

iv) 8, 12 and 18.
Solution:
Factors of 8 = 1, 2, 4, 8
Factors of 12 = 1, 2, 3, 4, 6, 12
~~Common factors~~
Factors of 18 = 1, 2, 3, 6, 9, 18

Common factor: 2.
HCF = 2.

v) 24, 36, 45 and 60.
Solution:
Factors of 24 = 1, 2, 3, 4, 6, 8, 12, 24
Factors of 36 = 1, 2, 3, 4, 6, 9, 12, 18, 36
Factors of 45 = 1, 3, 5, 9, 15, 45
Factors of 60 = 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60
Common factor = 3
HCF = 3

When the HCF of any two numbers is 1, then they are called to be coprime.

ii) 25 and 20

Solution:

~~Common~~ factors of 25 = 1, 5, 25

Factors of 20 = 1, 2, 4, 5, 10, 20

Common factor = 5, HCF = 5.

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

i) 5 and 8

Solution:

$5 = 5$ ; $8 = 2 \times 2 \times 2$

prime

As, there are no common factors of 5 and 8 instead of 1, so, the H.C.F of 5 and 8 is 1.

ii) 24 and 49

Solution:

$24 = 2 \times 2 \times 2 \times 3$

$49 = 7 \times 7$

prime

As, there are no common factors of 24 and 49 instead of 1, so, the H.C.F of 24 and 49 is 1.

iii) 40, 60 and 80,

Solution:

$40 = 2 \times 2 \times 2 \times 5$

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

$90 = 2 \times 3 \times 3 \times 5$

| 2 \| 40 | 2 \| 60 | 2 \| 80 |
|---|---|---|
| 2 \| 20 | 2 \| 30 | 2 \| 40 |
| 2 \| 10 | 3 \| 15 | 2 \| 20 |
| 5 | 5 | 2 \| 10 |
| | | 5 |

prime

Common factors = 2 and 5 = $2 \times 5 = 20$

iv) 48, 84 and 88.

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

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

$88 = 2 \times 2 \times 2 \times 11$

$2 \times 2 = 4$

v) 12, 16 and 28.

Solution:

$12 = 2 \times 2 \times 3$

$16 = 2 \times 2 \times 2 \times 2$

$28 = 2 \times 2 \times 7$

Common factors: 2

$HCF = 2 \times 2 = 4$

Ans: HCF is 4.

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

i) 16 and 24

Solution:

$$\begin{array}{r} 16 \overline{)24}\ (1 \\ -16 \\ \hline 8 \overline{)16}\ (2 \\ -16 \\ \hline 0 \end{array}$$

HCF = 8.

ii) 18 and 30

Solution:

$$\begin{array}{r} 18 \overline{)30}\ (1 \\ -18 \\ \hline 12 \overline{)18}\ (1 \\ -12 \\ \hline 6 \overline{)12}\ (2 \\ -12 \\ \hline 0 \end{array}$$

HCF = 6

iii) 7, 14 and 24

$$7 \overline{)14}\ (2$$
$$-14$$
$$0$$

HCF of 14 and 7 = 7

$$7 \overline{)24}\ (3$$
$$-21$$
$$3 \overline{)7}\ (2$$
$$-6$$
$$1 \overline{)3}\ (3$$
$$-3$$
$$0$$

HCF = 1.

4. i) $45 \overline{)75}\ (1$
$$-45$$
$$30 \overline{)45}\ (1$$
$$-30$$
$$15 \overline{)30}\ (2$$
$$-30$$
$$0$$

HCF of 45 and 75 = 15

$$15 \overline{)135}\ (9$$
$$-135$$
$$0$$

ii) 48, 36 and 96

$$\begin{array}{r|l} 36 & 48 \;(1 \\ -36 & \\ \hline 12 & 36 \;(3 \\ -36 & \\ \hline 0 & \end{array}$$

HCF of 48 and 36 is 12.

$$\begin{array}{r|l} 12 & 96 \;(8 \\ -96 & \\ \hline 0 & \end{array}$$

HCF of 96 and 12 = 12

HCF of 48, 36 and 96 = 12

iii) 66, 33 and 132

Solution:

$$\begin{array}{r|l} 33 & 66 \;(2 \\ -66 & \\ \hline 0 & \end{array}$$

HCF of 66 and 33 = 33

$$\begin{array}{r|l} 33 & 132 \;(4 \\ -132 & \\ \hline 0 & \end{array}$$

HCF of 33 and 132 = 33

So, HCF of 66, 33 and 132 is 33.

iv) 24, 36, 60 and 132.

Solution:

$24\overline{)36}\,(1$
$-24$
$12\overline{)24}\,(2$
$-24$
$0$

HCF of 24 and 36 = 12

$60\overline{)132}\,(2$
$-120$
$12\overline{)60}\,(5$
$-60$
$0$

HCF of 132 and 60 = 12

So, HCF of 24, 36, 60 and 132 is 12.

v) 30, 60, 90 and 105.

$30\overline{)60}\,(2$
$-60$
$0$

HCF of 30 and 60 = 30.

$90\overline{)105}\,(1$
$-90$
$15\overline{)90}\,(6$
$-90$
$0$

HCF of 90 and 105 = 15

15 ) 30 ( 2
−30
0

HCF of 30, 60, 90 and 105 = 15.

Homework

3. iv) 70, 80, 120 and 150

Solution:

70 ) 80 ( 1
−70
10 ) 70 ( 7
−70
0

HCF of 70 and 80 = 10

120 ) 150 ( 1
−120
30 ) 120 ( 4
−120
0

HCF of 150 and 120 = 30

10 ) 30 ( 3
0

HCF of 70, 80, 120 and 150 = 10

v) 32, 56, 46

32 ) 56 ( 1
−32
24 ) 32 ( 1
−24
8 ) 24 ( 3
24
0

HCF of 56 and 32 = 8

$8\overline{)56}(7$
$-56$
$0$

So, HCF of 32, 56 and 46 = 8

5. The greatest number that divides 180, 225 and 315 completely is the HCF,

HCF of 180, 225 and 315 :

HCF of 180 and 225 : $180\overline{)225}(1$
$-180$
$45\overline{)180}(4$
$-180$
$0$

HCF of 180 and 225 = 45

HCF of 45 and 315 : $45\overline{)315}(7$
$-315$
$0$

So, HCF or the greatest number dividing 180, 225 and 315 completely is 45.

6. Factors of 45 = 1, 3, 5, 9, 15, 45
Factors of 56 = 1, 2, 4, 7, 8, 14, 28, 56
As there are no common factors or there is no HCF of 45 and 56 instead of 1, so, there are called co-primes.

7. The pairs of co-prime numbers are—

15, 16 ; 15, 28 ; 16, 21.

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8. $93-3=90$, $111-3=108$, $129-3=126$

So, the HCF of 90, 108 and 126 is:-

HCF of 90 and 108:

$$\begin{array}{r} 90\overline{)108}\,(1 \\ -\,90 \\ \hline 18\overline{)90}\,(5 \\ -\,90 \\ \hline 0 \end{array}$$

HCF of 18 and 126:

$$\begin{array}{r} 18\overline{)126}\,(7 \\ -\,126 \\ \hline 0 \end{array}$$

So, the greatest number which when divided by 93, 111 and 129, leaving a remainder of 3 is 18