Ex. 8B

1) i) 16, 35

Ans → Factors of 16 are → 1, 2, 4, 8, 16.

Factors of 35 are → 1, 5, 7, 35.

HCF → 1

iii) 27, 75

Ans → Factors of 27 are → 1, 3, 9, 27.

Factors of 75 are → 1, 3, 5, 15, 25, 75.

Common factors → 1, 3.

H.C.F. → 3

iv) 8, 12, 18

Ans → Factors of 8 → 1, 2, 4, 8.

Factors of 12 → 1, 2, 3, 4, 6, 12.

Factors of 18 → 1, 2, 3, 6, 9, 18.

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Common factor = 1 and 2

H.C.F. = 2

ii) 25 and 20

Ans → Factors of 25 are → 1, 5, 25.

Factors of 20 are → 1, 2, 10, 4, 5, 20.

Common factors = 1, 5

H.C.F. → 5

iii) 24, 36, 45 and 60

Ans → Factors of 24 are → 1, 2, 3, 4, 6, 12, 8, 24.

Factors of 36 are → 1, 2, 3, 4, 6, 18, 12, 9, 36.

Factors of 45 are → 1, 3, 15, 5, 9, 45.

Factors of 60 are → 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60.

Common factors = 1, 3

H.C.F. → 3

When two numbers have only 1 as the H.C.F. those numbers are called coprime numbers.

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

i) 5 and 8

Ans →

5	5
	1

2	8
2	4
	2

$5 = 5, 1$

$8 = 2, 1, 2, 2$

H.C.F. = 1

ii) 24 and 49

2	24
2	12
2	6
	3

7	49
7	7
	1

$24 = 2, 3, 1, 2, 2$

$49 = 7, 1, 7$

H.C.F. = 1

iii) 40, 60, 80

2	40
2	20
2	10
5	5
	1

2	60
2	30
3	15
5	5
	1

2	80
2	40
2	20
2	10
5	5
	1

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$40 = 2, 2, 2, 5, 1$

$60 = 2, 2, 3, 5, 1$

$80 = 2, 2, 2, 2, 5, 1$

H.C.F. $= 2 \times 2 \times 5 \times 1 = 20$

iii) 48, 84, 88

48		84		88	
2	48	2	84	2	88
2	24	2	42	2	44
2	12	3	21	2	22
2	6	7	7	11	11
2	3		1		1
	1				

$48 = 2, 2, 2, 2, 3, 1$

$84 = 2, 2, 3, 7, 1$

$88 = 2, 2, 2, 11, 1$

H.C.F. $= 2 \times 2 \times 1 = 4$

iv) 12, 16, 28

12		16		28	
2	12	2	16	2	28
2	6	2	8	2	14
3	3	2	4	7	7
	1	2	2		1
			1		

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12 = 2, 2, 3, 1

16 = 2, 2, 2, 2, 1

28 = 2, 2, 7, 1

H.C.F. = 2 X 2 X 1 = 4

12 = 1, 2, 3, 4, 6, 12

18 = 1, 2, 3, 6, 9, 18

Common factors → 1, 2, 3, 6.

H.C.F. = 6

3) Using the division

i) 16 and 24

Ans → 16) 24 (1
−16
8) 16 (2
−16
0

H.C.F. = 8

ii) 32, 56 and 46

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

8) 46 (5
−40
6) 8 (1
−6
2) 6 (3
−6
0

Therefore, the H.C.F. is 2.

Q) 45, 75, 135

45) 75 (1
−45
30) 45 (1
−30
15) 30 (2
−30
0

15) 135 (9
−135
0

H.C.F. = 15

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ii) 18 and 30

```
18)30(1
 -18
  12)18(1
    -12
     6)12(2
      -12
       0
```

H.C.F. = 6

iii) 7, 14 and 24

```
7)14(2
 -14
  0
```

```
7)24(3
 -21
  3)7(2
   -6
    1)3(3
     -3
      0
```

H.C.F. = 1.

iv) 70, 80, 120 and 150

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70) 80 (1
−70
10) 70 (7
−70
0

10) 120 (12
−120
0

10) 150 (15
−150
0

H.C.F. = 10

4)ii) 48, 36 and 96

Ans → 36) 48 (1
−36
12) 36 (3
−36
0

12) 96 (8
−96
0

H.C.F. = 12

iii) 66, 33 and 132

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$$33\overline{)66}\,(2$$
$$-66$$
$$0$$

$$33\overline{)132}\,(4$$
$$-132$$
$$0$$

H.C.F. = 33

iv) 24, 36, 60 and 132

Ans →

2 | 24	2 | 36	2 | 60	2 | 132
2 | 12	2 | 18	2 | 30	2 | 66
2 | 6	3 | 9	3 | 15	3 | 33
3	3	5	11

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

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

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

$132 = 2 \times 2 \times 3 \times 11$

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

v) 30, 60, 90 and 105

2 | 30	2 | 60	2 | 90	3 | 105
3 | 15	2 | 30	3 | 45	5 | 35
5	3 | 15	3 | 15	7
	5	5	

$30 = 2 \times 3 \times 5$

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

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

$105 = 3 \times 5 \times 7$

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

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

Ans:-

```
180 ) 225 ( 1
    - 180
    -----
      45 ) 180 ( 4
         - 180
         -----
           0
```

```
45 ) 315 ( 7
   - 315
   -----
     0
```

H.C.F. $= 45$

Therefore, the greatest number that divides each of 180, 225 and 315 completely that number is 45.

6) Show that 45 and 56 are co-primes numbers.

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Ans →
$$45\overline{)56}\,(1$$
$$-45$$
$$\overline{11)45\,(4}$$
$$-44$$
$$\overline{1)11\,(11}$$
$$-11$$
$$\overline{0}$$

H.C.F. = 1

Therefore, the H.C.F. of 56 and 45 is 1. The numbers which have the H.C.F. as 1 are called co-prime numbers. Therefore, 56 and 45 are also co-prime as their H.C.F. is 1.

7) Out of 15, 16, 21 and 28, find out all the pairs of co-primes.

Ans → H.C.F. of 15 and 16.

$$15\overline{)16}\,(1$$
$$-15$$
$$\overline{1)15\,(15}$$
$$-15$$
$$\overline{0}$$

H.C.F. = 1

Therefore, 15 and 16 are co-primes.

2) H.C.F. of 15 and 21

```
15)21(1
  -15
   6)15(2
    -12
     3)6(2
      -6
       0
```

Therefore, 15 and 21 are not co-primes.

3) H.C.F. of 15 and 28.

```
15)28(1
  -15
   13)15(1
     -13
      2)13(6
        -12
         1)2(2
           -2
            0
```

Therefore, 15 and 28 are co-primes.

4) H.C.F. of 16 and 21.

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Ans → 16)21(1
−16
5)16(3
−15
1)5(5
−5
0

Therefore, 16 and 21 are co-primes.

5) H.C.F. of 16 and 28

16)28(1
−16
12)16(1
−12
4)12(3
−12
0

Therefore, 16 and 28 are not co-primes.

6) H.C.F. of 21 and 28

21)28(1
−21
7)21(3
−21
0

Therefore, 21 and 28 are not co-primes.

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Therefore, all the pairs of co-primes are 15 and 16; 15 and 28; 16 and 21.

8) Find the greatest number that will divide 93, 111 and 129, leaving a remainder 3 in each case of the given numbers in above line.

Ans→ Since, the greatest number that will divide 93, 111 and 129, leaving a remainder of 3 in each case = 93-3 = 90, 111-3 = 108, 129-3 = 126.

Therefore, the H.C.F. of 90, 108 and 126 is:

```
90)108(1
 -90
  18)90(5
    -90
     0

18)126(7
  -126
     0
```

H.C.F. = 18

Therefore, the greatest number is 18.

Ques