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H.C.F AND L.C.M

SUBJECT : MATHEMATICS
CHAPTER NUMBER: 08
CHAPTER NAME : H.C.F AND L.C.M
SUBTOPIC : HCF ,Prime Factor and Division Method
PERIOD NO:2

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Learning outcomes

- Students will be able to find H.C.F of given numbers.
- Students will develop application skill.

Previous Knowledge Test

1. Write the prime factors of:

(i) 16 **(ii) 27**

(iii) 35 **(iv) 49**

Negative numbers and Integers

- Students will Learn H.C.F with the help of a video .
- https://www.youtube.com/watch?v=tPHpQhQKQu8

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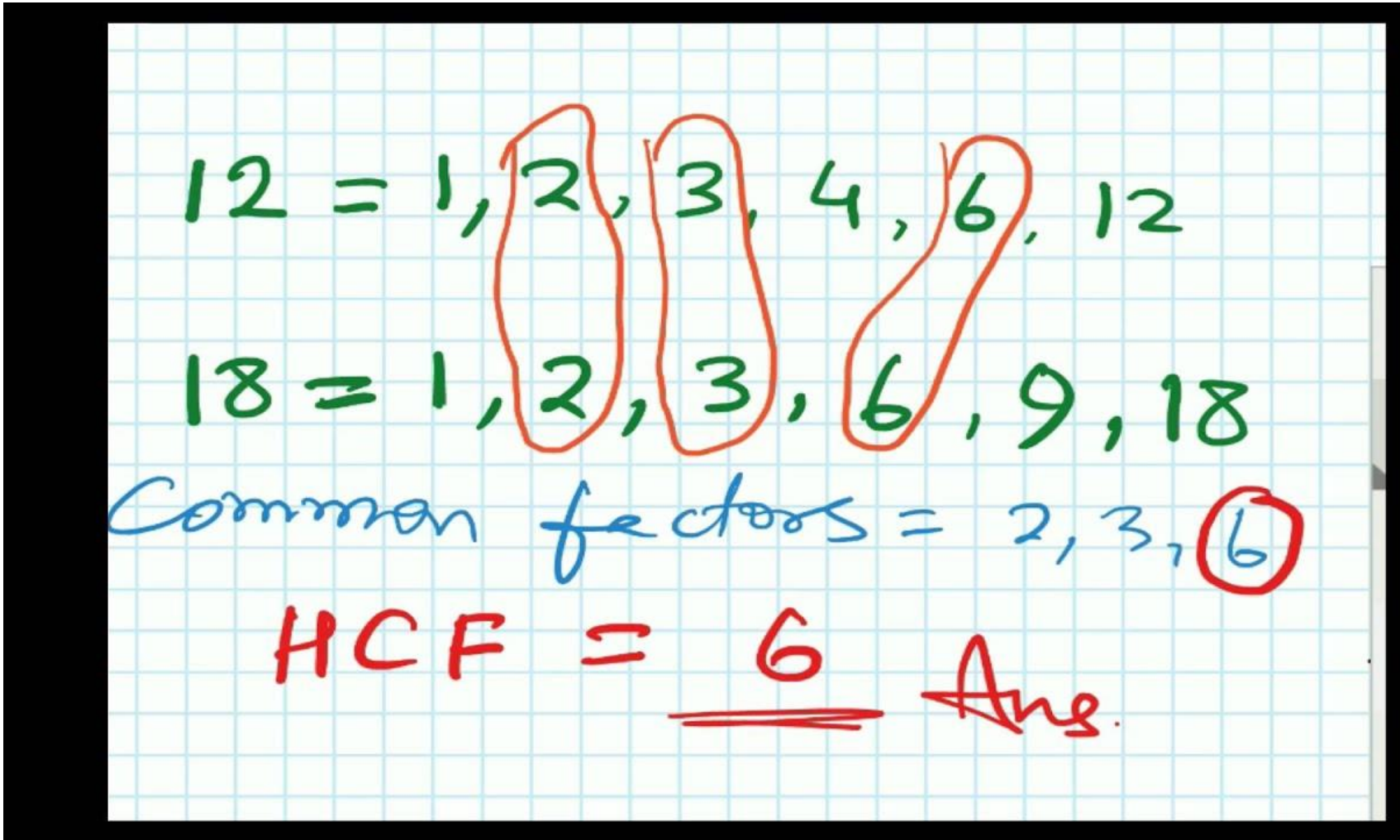
12 = 1, 2, 3, 4, 6, 12
18 = 1, 2, 3, 6, 9, 18
Common factors = 2, 3, 6
HCF = 6
Ans.

Division by common factors

3	45, 60
5	15, 20
	3, 4

Common factors are 3, 5

3	45, 135
3	15, 45
5	5, 15
	1, 3

3	45, 135
3	15, 45
5	5, 15
	1, 3

H.C.F = 3 x 3 x 5

= 45

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Evaluation Question EX 8B

Q2.(iii) 40, 60 and 80 **(iv) 48, 84 and 88**

(v) 12, 16 and 28

iii) The prime factors of 40, 60 and 80 are as follows:

$P_{40} = 2 \times 2 \times 2 \times 5$ $P_{60} = 2 \times 2 \times 3 \times 5$

$P_{80} = 2 \times 2 \times 2 \times 2 \times 5$

Common prime factors between 40, 60 and 80 = $2 \times 2 \times 5$

Hence, H.C.F. of 40, 60 and 80 = 20

Evaluation Question

(iv) The prime factors of 48, 84 and 88 are as follows:

$P_{48} = 2 \times 2 \times 2 \times 2 \times 3$ $P_{84} = 2 \times 2 \times 3 \times 7$

$P_{88} = 2 \times 2 \times 2 \times 11$

Common prime factors between 48, 84 and 88 = 2×2

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

Evaluation Question

v) The prime factors of 12, 16 and 28 are as follows:

$P_{12} = 2 \times 2 \times 3$ $P_{16} = 2 \times 2 \times 2 \times 2$ $P_{28} = 2 \times 2 \times 7$

Common prime factors between 12, 16 and 28 = 2×2

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

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

Evaluation Question

(i) 16 and 24
Using division method, we get

16	24	1	
	16		
	8	16	2
		16	
		0	

Here, the last division is 8
Hence, H.C.F. of 16 and 24 = 8

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Evaluation Question

(iii) 7, 14 and 24
Using division method, we get
Here, last division is 1
Hence, H.C.F. of 7, 14 and 24 = 1

7	14	2
	14	
	0	

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

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

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

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

∴H.C.F. of 45, 75 and 135 = 15

(ii) $P_{48} = 2 \times 2 \times 2 \times 2 \times 3$

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

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

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

H.C.F of 48,36,96=12

EVALUATION QUESTIONS

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

Solution:

The greatest number that divides each of 180, 225 and 315 will be the H.C.F. of 180, 225 and 315

Using division method, the H.C.F of 180, 225 and 315 are shown below

180	225	1	
	180		
	45	180	4
		180	
		0	

45	315	7
	315	
	0	

Since last division is 45

∴H.C.F. of 180, 225 and 315 = 45

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Evaluation Question

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

Solution:

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

93 – 3 = 90

111 – 3 = 108

129 – 3 = 126

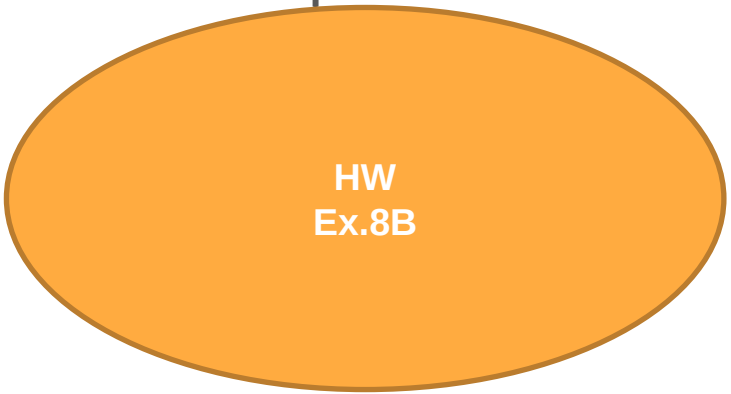
In each case, the H.C.F. of 90, 108 and 126 will be the greatest number that will divide 93, 111 and 129 leaving remainder 3

Using division method, the H.C.F. of 90, 108 and 126 is given below

Additional Homework

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

2. Show that 45 and 56 are co-prime numbers.



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