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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 : RECAPITULATION OF THE CHAPTER
PERIOD NO: 4

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Learning outcomes

- Students will be able to find prime factors of a given number.
- Students will be able to find H.C.F of given pair of numbers .
- Students will develop application skill.
- Students will be able to find L.C.M. of given numbers .
- Students will be able to solve problems based on LCM .

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PREVIOUS KNOWLEDGE TEST

Question 1.

State true or false : Give an example.

(i) H.C.F. of two prime numbers is 1.

(ii) H.C.F. of two co-prime numbers is 1.

(iii) L.C.M. of two prime numbers is equal to their product.

(iv) L.C.M. of two co-prime numbers is equal to their product.

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PREVIOUS KNOWLEDGE TEST

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Solution:

(i) True : Because the prime numbers have no common factor except 1.

(ii) True : Because co-prime numbers have no common factor except 1.

(iii) True : Because the prime number have no common factor except 1.

(iv) True : Because co-prime numbers have no common factor except 1.

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EVALUATION QUESTION (EX-8C)

Question 1.
Find the H.C.F. of :
(i) 108, 288 and 420
(ii) 36, 54 and 138

Solution:
(i) H.C.F. of 108, 288, 420 = 12

$$
\begin{array}{r|l}
108 & 288 \\
 & 216 \\
\hline
72 & 108 \\
 & 72 \\
\hline
36 & 72 \\
 & 72 \\
\hline
 & \times
\end{array}
\qquad
\begin{array}{r|l}
36 & 420 \\
 & 396 \\
\hline
24 & 36 \\
 & 24 \\
\hline
12 & 24 \\
 & 24 \\
\hline
 & \times
\end{array}
$$

(*ii*) H.C.F. of 36, 54 and 138 = 6

$$
\begin{array}{r|l}
36 & 54 \\
 & 36 \\
\hline
18 & 36 \\
 & 36 \\
\hline
 & \times
\end{array}
\qquad
\begin{array}{r|l}
18 & 138 \\
 & 126 \\
\hline
12 & 18 \\
 & 12 \\
\hline
6 & 12 \\
 & 12 \\
\hline
 & \times
\end{array}
$$

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Evaluation Question

Question 2.

Find the L.C.M. of:

(i) 72, 80 and 252

(ii) 48, 66 and 120

Solution:

L.C.M. 72, 80, 252

2	72, 80, 252
2	36, 40, 126
2	18, 20, 63
3	9, 10, 63
3	3, 10, 21
	1, 10, 7

$= 2 \times 2 \times 2 \times 3 \times 3 \times 10 \times 7 = 5040$

(*ii*) L.C.M. of 48, 66 and 120

2	48, 66, 120
2	24, 33, 60
2	12, 33, 30
3	6, 33, 15
	2, 11, 5

$= 2 \times 2 \times 2 \times 2 \times 3 \times 5 \times 11 = 2640$

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Evaluation Question

Question 4.

The product of two numbers is 12096 and their H.C.F. is 36. Find their L.C.M.

Solution:

We know that

Product of two numbers = Product of their H.C.F. and L.C.M.

=> 12096 = 36 x L.C.M.

=> L.C.M. = 12096/36 = 336

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Evaluation Question

Question 5.

The product of the H.C.F. and the L.C.M. of two numbers is 1152. If one number is 48, find the other one.

Solution:

We know that:

Product of two numbers = Product of their H.C.F. and L.C.M.

=> 1st number x 2nd number = Product of their H.C.F. and L.C.M.

=> 48 x 2nd number = 1152

=> 2nd number = 1152/48 = 24

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Evaluation Question

2	28, 42
7	14, 21
	2, 3

Question 6.

(i) Find the smallest number that is completely divisible by 28 and 42.

(ii) Find the largest number that can divide 28 and 42 completely.

Solution:

(i) We know that the least number which is divisible by 28 and 42 is their L.C.M.

L.C.M. of 28 and 42 = 2 x 2 x 3 x 7 = 84

(ii) We know that the largest number which can divide 28 and 42 completely will be their H.C.F.

H.C.F. of 28 and 42 = 14

$$
\begin{array}{l}
28\overline{)42}(1 \\
\quad 28 \\
\quad\overline{\quad} \\
14\overline{)28}(2 \\
\quad\ 28 \\
\quad\overline{\times}
\end{array}
$$

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Evaluation Question

Question 7.

Find the L.C.M. of 140 and 168. Use the L.C.M. obtained to find the H.C.F. of the given numbers.

Solution:

Numbers are 140 and 168

L.C.M. of 140 and 168

2	140, 168
2	70, 84
7	35, 42
	5, 6

$= 2 \times 2 \times 7 \times 5 \times 6 = 840$

$$\text{H.C.F.} = \frac{\text{1st number} \times \text{2nd number}}{\text{L.C.M.}}$$

$$= \frac{140 \times 168}{840} = 28$$

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Evaluation Question

Question 8.

Find the H.C.F. of 108 and 450 and use the H.C.F. obtained to find the L.C.M. of the given numbers.

Solution:

Numbers are given : 108 and 450

H.C.F. of 108 and 450= 18

$$
\begin{array}{r}
108\overline{)450}(4 \\
\underline{432} \\
18\overline{)108}(6 \\
\underline{108} \\
\times
\end{array}
$$

$$\therefore \text{ L.C.M.} = \frac{\text{1st number} \times \text{2nd number}}{\text{H.C.F.}}$$

$$= \frac{108 \times 450}{18} = 2700$$

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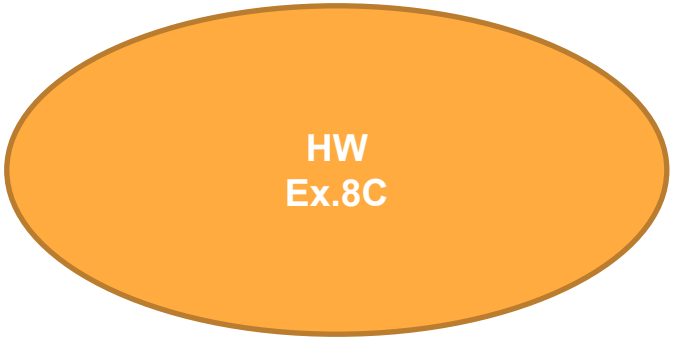
Homework



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AHA

1.The traffic lights at three different road crossing change after every 48 sec, 72 sec and 108 sec respectively. If they change simultaneously at 7:00 am, at what time will they change simultaneously again?

2.Three tankers contain 403 litres, 434 litres and 465 litres of diesel. Find maximum capacity of a container that can measure the diesel of the three containers exact number of times.

THANKING YOU

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