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How does listing multiples help to identify LCM?

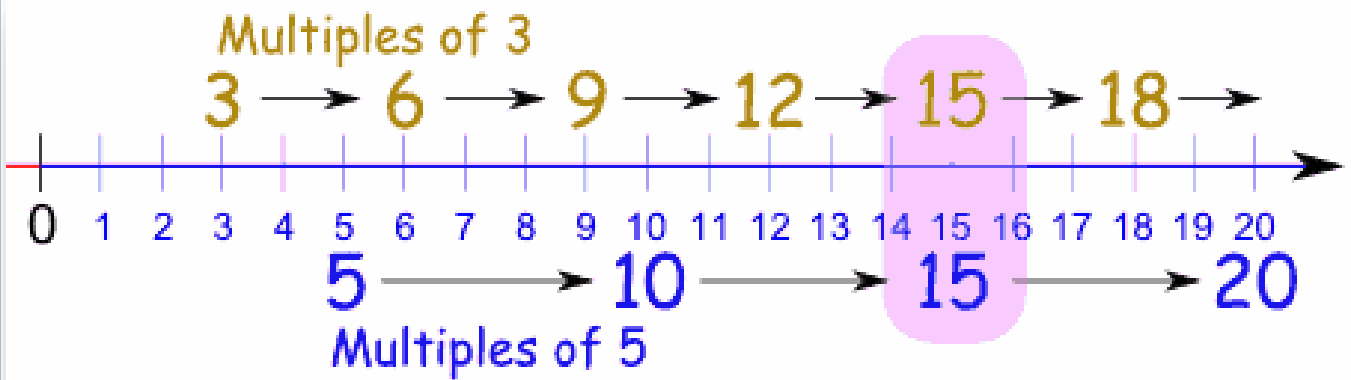
Can you list multiples of 18 and 26 to find their lowest common multiple?

Multiples of 8	Multiples of 12
8	12
16	24
24	36
32	48
40	60
48	72
56	84
64	96
72	108
80	120

LCM (Lowest Common Multiple) is indicated by lines connecting 24 to 24, 48 to 48, and 72 to 72.

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What does this numberline show? LCM of 3 and 5 or HCF of 15?



Can you draw your own numberline showing the LCM for 8 and 14...



FACTOR LCM FACTORISE
 PRIME PRODUCT HCF
 MULTIPLE COMMON
 POWERS



		The HCF is the smallest number that is the factor of two numbers	The HCF of 16, 48 and 60 is 16	The LCM of 2, 3 and 12 is 12	The LCM of 7 and 9 is 63
A FACTOR divides exactly into a number	$2 \times 2 \times 3 \times 7 = 84$	The HCF of 16, 48 and 60 is 4	The HCF of 27 and 45 is 9	The LCM of 2, 3 and 12 is 24	The HCF of 27 and 45 is 3

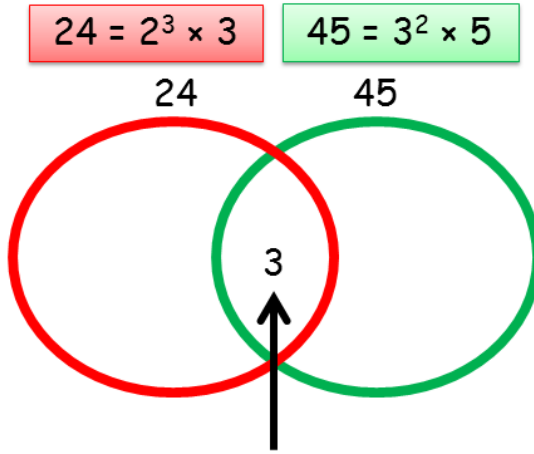
True

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False

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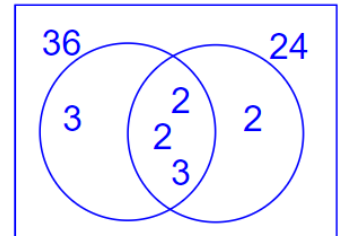
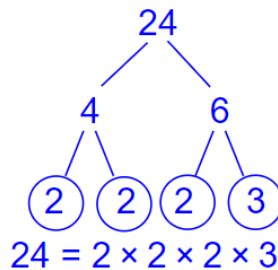
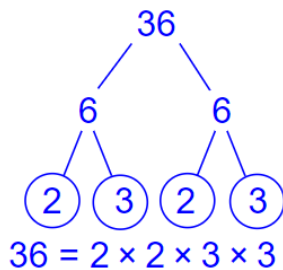
LO: Use a Venn diagram to find the HCF and LCM.



3 is the only common factor of both - this goes in the middle (intersection).



Write 36 and 24 as products of their prime factors.



Use the prime factors to find the LCM of 36 and 24.

$$\text{LCM} = 2 \times 2 \times 2 \times 3 \times 3 = 72$$

Use the prime factors to find the HCF of 36 and 24.

$$\text{HCF} = 2 \times 2 \times 3 = 12$$



Can you follow these methods. Which do you prefer? Can you find LCM of 2.4 and 3.6 ? Can you use this to find LCM or HCF of 240 and 360 ?

1 Find the missing factor:

a $3 \times \square = 6a$

b $3 \times \square = 15b$

c $2 \times \square = 8xy$

d $2x \times \square = 8x^2$

e $\square \times 2x = 2x^2$

f $\square \times 5x = -10x^2$

g $-a \times \square = ab$

h $\square \times a^2 = 4a^3$

i $3x \times \square = -9x^2y$

2 Find the HCF and LCM of the following:

a $2a$ and 6

b $5c$ and $8c$

c $8r$ and 27

d $12k$ and $7k$

e $3a$ and $12a$

f $5x$ and $15x$

g $25x$ and $10x$

h $24y$ and $32y$

i $36b$ and $54d$

3 Find the HCF and LCM of the following:

a $23ab$ and $7ab$

b abc and $6abc$

c $36a$ and $12ab$

d a^2 and a

e $9r$ and r^3

f $3q$ and qr

g $3b^2$ and $9b$

h dp^2 and pd

i $4r$ and $8r^2$

j $3pq$ and $6pq^2$

k $2a^2b$ and $6ab$

l $6xy$ and $18x^2y^2$

m $15a$, $20ab$ and $30b$

n $12wxz$, $12wz$, $24wxyz$

o $24p^2qr$, $36pqr^2$

4. Find the HCF and LCM of the following:

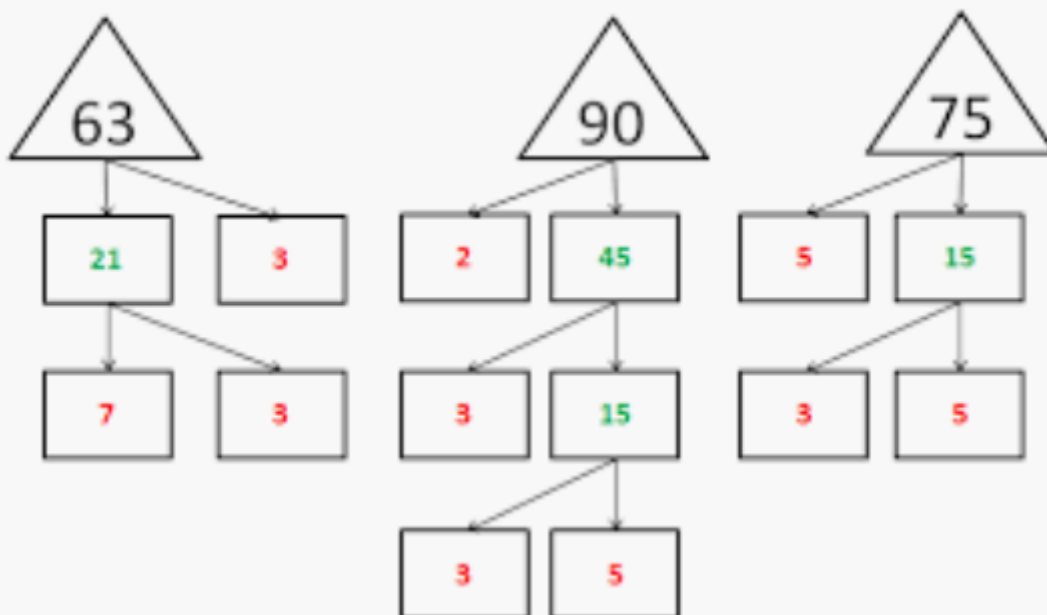
a. $x^4y^3z^4$, xy^5z^2

d. $9x^3y^3z^3$, $6x^2yz^4$

g. $\frac{x^3y^2}{5z^4}$, $\frac{xy^3}{10z^2}$



What does



this diagram show? Can you use the info to find LCM of 63 and 90?

Exercise 1d

Find the H.C.F. of the following, leaving the answer in prime factors:

1 $2 \times 3 \times 3 \times 5$; $2 \times 2 \times 3 \times 3 \times 3$; $3 \times 3 \times 5 \times 7$

2 $2 \times 2 \times 3 \times 5$; $2 \times 2 \times 3 \times 3 \times 7$; $2 \times 3 \times 3 \times 7$

3 $2 \times 3 \times 3 \times 5$; $2 \times 2 \times 2 \times 5$; $2 \times 2 \times 3 \times 5 \times 7$

4 $2 \times 2 \times 2 \times 3 \times 3 \times 7$; $2 \times 2 \times 3 \times 3 \times 3$;
 $2 \times 3 \times 3 \times 3 \times 7$

5 $2 \times 3 \times 3 \times 5 \times 7$; $3 \times 5 \times 5 \times 7 \times 7$;

$2 \times 2 \times 3 \times 5 \times 5 \times 7$

Find the H.C.F. of the following, leaving the answer in prime factors and using the index notation:

6 $2^3 \times 3^2 \times 7$; $2^2 \times 3 \times 5^2$; $2^2 \times 3^3 \times 5$

7 $2^2 \times 3^3 \times 5$; $2^3 \times 3^4 \times 5$; $2 \times 3^5 \times 7^2$

8 $2^2 \times 3^3 \times 5^2$; $3^2 \times 5^3 \times 7$; $2 \times 3^2 \times 5^2 \times 7$

9 $2^3 \times 3^3 \times 5^3$; $2^4 \times 3 \times 5^2 \times 7$; $2^5 \times 3^2 \times 5 \times 7^2$

10 $2^3 \times 5^2 \times 7$; $2^2 \times 3^2 \times 5$; $3^3 \times 5^3 \times 7^2$



1 (a) Circle the highest common factor (HCF) of $4x^2y$ and $8xy^3$

[1 mark]

$2xy$

$4xy$

$8x^2y^3$

$8x^3y^4$

$32x^2y^3$

1 (b) Circle the lowest common multiple (LCM) of $4x^2y$ and $8xy^3$

[1 mark]

$2xy$

$4xy$

$8x^2y^3$

$8x^3y^4$

$32x^2y^3$



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6 and 7	LCM 42 HCF 1	5 and 10
LCM 10 HCF 5	15 and 25	LCM 75 HCF 5
8 and 20	LCM 40 HCF 4	12 and 30

MATCH UP

LCM 60 HCF 6	9 and 6	LCM 18 HCF 3
10 and 8	LCM 40 HCF 2	14 and 20
LCM 140 HCF 2	18 and 15	LCM 90 HCF 3



6



$$660 = 2^2 \times 3 \times 5 \times 11$$

$$252 = 2^2 \times 3^2 \times 7$$

$$\text{HCF} = 2 \times 2 \times 3$$

$$= 12$$

$$\text{LCM} = 5 \times 11 \times 2 \times 2$$

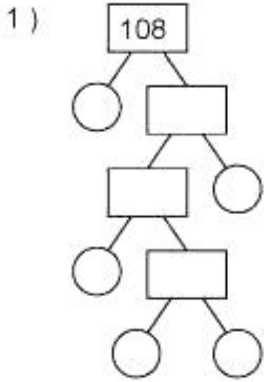
$$\times 3 \times 7 \times 3$$

$$= 13,860$$

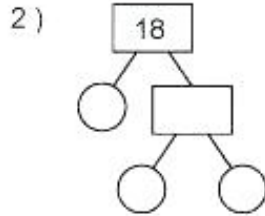
Do you agree
that HCF is 12,
LCM is 13,860 ?

Check it...

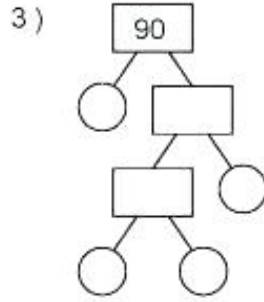
Find the Prime Factors of the Numbers



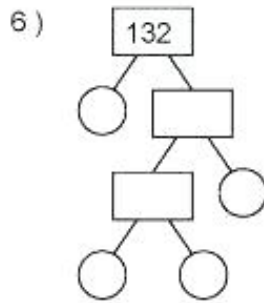
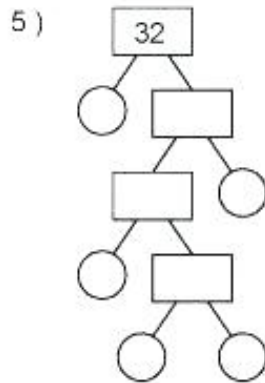
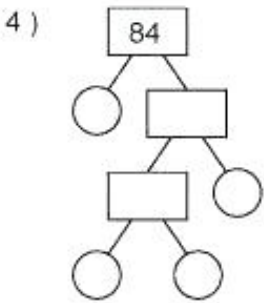
Prime Factors
 $_x_x_x_x_ = 108$



Prime Factors
 $_x_x_ = 18$



Prime Factors
 $_x_x_x_ = 90$



Is this a good method for finding HCF and LCM ? What method do you use?

HCF and LCM

HCF of 24 and 36
 $= 2 \times 2 \times 3 = 12$

LCM of 24 and 36
 $= 2 \times 2 \times 3 \times 2 \times 3 = 72$

