Worksheet

07/27/2020

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Problem quickname: 3333

1)

Quick: 3333

Determine the lcm, the least common multiple, of the two numbers. Find the prime factorizations as in the example and derive the lcm.

a) The lcm of 4 and 29 is $116 = 2^2 \cdot 29$.

The prime factorizations are: $4 = 2^2$, $29 = 29^1$.

Determination of the list of all occurring prime factors:$\{2{,}29\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	4	=	2^2	$\cdot$	29^0
Second number	29	=	2^0	$\cdot$	29^1
Prime factor exponent			$2 > 0$		$1 > 0$
lcm	116	=	2^2	$\cdot$	29^1

b) The lcm of 4 and 112 is $112 = 2^4 \cdot 7$.

The prime factorizations are: $4 = 2^2$, $112 = 2^4 \cdot 7^1$.

Determination of the list of all occurring prime factors:$\{2{,}7\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	4	=	2^2	$\cdot$	7^0
Second number	112	=	2^4	$\cdot$	7^1
Prime factor exponent			$4 > 2$		$1 > 0$
lcm	112	=	2^4	$\cdot$	7^1

c) The lcm of 5 and 51 is $255 = 3 \cdot 5 \cdot 17$.

The prime factorizations are: $5 = 5^1$, $51 = 3^1 \cdot 17^1$.

Determination of the list of all occurring prime factors:$\{3{,}5{,}17\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	5	=	3^0	$\cdot$	5^1	$\cdot$	17^0
Second number	51	=	3^1	$\cdot$	5^0	$\cdot$	17^1
Prime factor exponent			$1 > 0$		$1 > 0$		$1 > 0$
lcm	255	=	3^1	$\cdot$	5^1	$\cdot$	17^1

d) The lcm of 24 and 38 is $456 = 2^3 \cdot 3 \cdot 19$.

The prime factorizations are: $24 = 2^3 \cdot 3^1$, $38 = 2^1 \cdot 19^1$.

Determination of the list of all occurring prime factors:$\{2{,}3{,}19\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	24	$=$	2^3	$\cdot$	3^1	$\cdot$	19^0
Second number	38	$=$	2^1	$\cdot$	3^0	$\cdot$	19^1
Prime factor exponent			$3>1$		$1>0$		$1>0$
lcm	456	$=$	2^3	$\cdot$	3^1	$\cdot$	19^1

e) The lcm of 20 and 25 is $100 = 2^2 \cdot 5^2$.

The prime factorizations are: $20 = 2^2 \cdot 5^1$, $25 = 5^2$.

Determination of the list of all occurring prime factors:$\{2{,}5\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	20	$=$	2^2	$\cdot$	5^1
Second number	25	$=$	2^0	$\cdot$	5^2
Prime factor exponent			$2>0$		$2>1$
lcm	100	$=$	2^2	$\cdot$	5^2

f) The lcm of 8 and 416 is $416 = 2^5 \cdot 13$.

The prime factorizations are: $8 = 2^3$, $416 = 2^5 \cdot 13^1$.

Determination of the list of all occurring prime factors:$\{2{,}13\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	8	$=$	2^3	$\cdot$	13^0
Second number	416	$=$	2^5	$\cdot$	13^1
Prime factor exponent			$5>3$		$1>0$
lcm	416	$=$	2^5	$\cdot$	13^1

g) The lcm of 9 and 111 is $333 = 3^2 \cdot 37$.

The prime factorizations are: $9 = 3^2$, $111 = 3^1 \cdot 37^1$.

Determination of the list of all occurring prime factors:$\{3{,}37\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	9	$=$	3^2	$\cdot$	37^0
Second number	111	$=$	3^1	$\cdot$	37^1
Prime factor exponent			$2>1$		$1>0$
lcm	333	$=$	3^2	$\cdot$	37^1

h) The lcm of 2 and 69 is $138 = 2 \cdot 3 \cdot 23$.

The prime factorizations are: $2 = 2^1$, $69 = 3^1 \cdot 23^1$.

Determination of the list of all occurring prime factors:$\{2,3,23\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	2	=	2^1	$\cdot$	3^0	$\cdot$	23^0
Second number	69	=	2^0	$\cdot$	3^1	$\cdot$	23^1
Prime factor exponent			$1>0$		$1>0$		$1>0$
lcm	138	=	2^1	$\cdot$	3^1	$\cdot$	23^1

2)

Quick: 3333

Determine the lcm, the least common multiple, of the two numbers. Find the prime factorizations as in the example and derive the lcm.

a) The lcm of 7 and 10 is $70 = 2 \cdot 5 \cdot 7$.

The prime factorizations are: $7 = 7^1$, $10 = 2^1 \cdot 5^1$.

Determination of the list of all occurring prime factors:$\{2,5,7\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	7	=	2^0	$\cdot$	5^0	$\cdot$	7^1
Second number	10	=	2^1	$\cdot$	5^1	$\cdot$	7^0
Prime factor exponent			$1>0$		$1>0$		$1>0$
lcm	70	=	2^1	$\cdot$	5^1	$\cdot$	7^1

b) The lcm of 6 and 11 is $66 = 2 \cdot 3 \cdot 11$.

The prime factorizations are: $6 = 2^1 \cdot 3^1$, $11 = 11^1$.

Determination of the list of all occurring prime factors:$\{2,3,11\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	6	=	2^1	$\cdot$	3^1	$\cdot$	11^0
Second number	11	=	2^0	$\cdot$	3^0	$\cdot$	11^1
Prime factor exponent			$1>0$		$1>0$		$1>0$
lcm	66	=	2^1	$\cdot$	3^1	$\cdot$	11^1

c) The lcm of 6 and 13 is $78 = 2 \cdot 3 \cdot 13$.

The prime factorizations are: $6 = 2^1 \cdot 3^1$, $13 = 13^1$.

Determination of the list of all occurring prime factors:$\{2,3,13\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	6	=	2^1	$\cdot$	3^1	$\cdot$	13^0
Second number	13	=	2^0	$\cdot$	3^0	$\cdot$	13^1
Prime factor exponent			$1>0$		$1>0$		$1>0$
lcm	78	=	2^1	$\cdot$	3^1	$\cdot$	13^1

d) The lcm of 6 and 28 is $84 = 2^2 \cdot 3 \cdot 7$.

The prime factorizations are: $6 = 2^1 \cdot 3^1$, $28 = 2^2 \cdot 7^1$.

Determination of the list of all occurring prime factors:$\{2,3,7\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	6	$=$	2^1	$\cdot$	3^1	$\cdot$	7^0
Second number	28	$=$	2^2	$\cdot$	3^0	$\cdot$	7^1
Prime factor exponent			$2 > 1$		$1 > 0$		$1 > 0$
lcm	84	$=$	2^2	$\cdot$	3^1	$\cdot$	7^1

e) The lcm of 9 and 27 is $27 = 3^3$.

The prime factorizations are: $9 = 3^2$, $27 = 3^3$.

Determination of the list of all occurring prime factors:$\{3\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	9	$=$	3^2
Second number	27	$=$	3^3
Prime factor exponent			$3 > 2$
lcm	27	$=$	3^3

f) The lcm of 2 and 36 is $36 = 2^2 \cdot 3^2$.

The prime factorizations are: $2 = 2^1$, $36 = 2^2 \cdot 3^2$.

Determination of the list of all occurring prime factors:$\{2,3\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	2	$=$	2^1	$\cdot$	3^0
Second number	36	$=$	2^2	$\cdot$	3^2
Prime factor exponent			$2 > 1$		$2 > 0$
lcm	36	$=$	2^2	$\cdot$	3^2

g) The lcm of 3 and 27 is $27 = 3^3$.

The prime factorizations are: $3 = 3^1$, $27 = 3^3$.

Determination of the list of all occurring prime factors:$\{3\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	3	$=$	3^1
Second number	27	$=$	3^3
Prime factor exponent			$3 > 1$
lcm	27	$=$	3^3

h) The lcm of 5 and 14 is $70 = 2 \cdot 5 \cdot 7$.

The prime factorizations are: $5 = 5^1$, $14 = 2^1 \cdot 7^1$.

Determination of the list of all occurring prime factors:$\{2,5,7\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	5	=	2^0	·	5^1	·	7^0
Second number	14	=	2^1	·	5^0	·	7^1
Prime factor exponent			$1 > 0$		$1 > 0$		$1 > 0$
lcm	70	=	2^1	·	5^1	·	7^1

3)

Quick: 3333

Determine the lcm, the least common multiple, of the two numbers. Find the prime factorizations and derive the lcm.

a) The lcm of 3 and 142 is $426 = 2 \cdot 3 \cdot 71$.

The prime factorizations are: $3 = 3^1$, $142 = 2^1 \cdot 71^1$.

Determination of the list of all occurring prime factors:$\{2,3,71\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	3	=	2^0	·	3^1	·	71^0
Second number	142	=	2^1	·	3^0	·	71^1
Prime factor exponent			$1 > 0$		$1 > 0$		$1 > 0$
lcm	426	=	2^1	·	3^1	·	71^1

b) The lcm of 6 and 188 is $564 = 2^2 \cdot 3 \cdot 47$.

The prime factorizations are: $6 = 2^1 \cdot 3^1$, $188 = 2^2 \cdot 47^1$.

Determination of the list of all occurring prime factors:$\{2,3,47\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	6	=	2^1	·	3^1	·	47^0
Second number	188	=	2^2	·	3^0	·	47^1
Prime factor exponent			$2 > 1$		$1 > 0$		$1 > 0$
lcm	564	=	2^2	·	3^1	·	47^1

c) The lcm of 2 and 524 is $524 = 2^2 \cdot 131$.

The prime factorizations are: $2 = 2^1$, $524 = 2^2 \cdot 131^1$.

Determination of the list of all occurring prime factors:$\{2,131\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	2	=	2^1	·	131^0
Second number	524	=	2^2	·	131^1
Prime factor exponent			$2 > 1$		$1 > 0$
lcm	524	=	2^2	·	131^1

d) The lcm of 18 and 243 is $486 = 2 \cdot 3^5$.

The prime factorizations are: $18 = 2^1 \cdot 3^2$, $243 = 3^5$.

Determination of the list of all occurring prime factors:$\{2,3\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	18	=	2^1	$\cdot$	3^2
Second number	243	=	2^0	$\cdot$	3^5
Prime factor exponent			$1 > 0$		$5 > 2$
lcm	486	=	2^1	$\cdot$	3^5

e) The lcm of 9 and 213 is $639 = 3^2 \cdot 71$.

The prime factorizations are: $9 = 3^2$, $213 = 3^1 \cdot 71^1$.

Determination of the list of all occurring prime factors:$\{3,71\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	9	=	3^2	$\cdot$	71^0
Second number	213	=	3^1	$\cdot$	71^1
Prime factor exponent			$2 > 1$		$1 > 0$
lcm	639	=	3^2	$\cdot$	71^1

f) The lcm of 9 and 138 is $414 = 2 \cdot 3^2 \cdot 23$.

The prime factorizations are: $9 = 3^2$, $138 = 2^1 \cdot 3^1 \cdot 23^1$.

Determination of the list of all occurring prime factors:$\{2,3,23\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	9	=	2^0	$\cdot$	3^2	$\cdot$	23^0
Second number	138	=	2^1	$\cdot$	3^1	$\cdot$	23^1
Prime factor exponent			$1 > 0$		$2 > 1$		$1 > 0$
lcm	414	=	2^1	$\cdot$	3^2	$\cdot$	23^1

g) The lcm of 23 and 28 is $644 = 2^2 \cdot 7 \cdot 23$.

The prime factorizations are: $23 = 23^1$, $28 = 2^2 \cdot 7^1$.

Determination of the list of all occurring prime factors:$\{2,7,23\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	23	=	2^0	$\cdot$	7^0	$\cdot$	23^1
Second number	28	=	2^2	$\cdot$	7^1	$\cdot$	23^0
Prime factor exponent			$2 > 0$		$1 > 0$		$1 > 0$
lcm	644	=	2^2	$\cdot$	7^1	$\cdot$	23^1

h) The lcm of 12 and 86 is $516 = 2^2 \cdot 3 \cdot 43$.

The prime factorizations are: $12 = 2^2 \cdot 3^1$, $86 = 2^1 \cdot 43^1$.

Determination of the list of all occurring prime factors:$\{2,3,43\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	12	$=$	2^2	$\cdot$	3^1	$\cdot$	43^0
Second number	86	$=$	2^1	$\cdot$	3^0	$\cdot$	43^1
Prime factor exponent			$2>1$		$1>0$		$1>0$
lcm	516	$=$	2^2	$\cdot$	3^1	$\cdot$	43^1

4) Quick: 3333

Determine the lcm, the least common multiple, of the two numbers. Find the prime factorizations as in the example and derive the lcm.

a) The lcm of 2 and 203 is $406 = 2 \cdot 7 \cdot 29$.

The prime factorizations are: $2 = 2^1$, $203 = 7^1 \cdot 29^1$.

Determination of the list of all occurring prime factors:$\{2,7,29\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	2	$=$	2^1	$\cdot$	7^0	$\cdot$	29^0
Second number	203	$=$	2^0	$\cdot$	7^1	$\cdot$	29^1
Prime factor exponent			$1>0$		$1>0$		$1>0$
lcm	406	$=$	2^1	$\cdot$	7^1	$\cdot$	29^1

b) The lcm of 4 and 73 is $292 = 2^2 \cdot 73$.

The prime factorizations are: $4 = 2^2$, $73 = 73^1$.

Determination of the list of all occurring prime factors:$\{2,73\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	4	$=$	2^2	$\cdot$	73^0
Second number	73	$=$	2^0	$\cdot$	73^1
Prime factor exponent			$2>0$		$1>0$
lcm	292	$=$	2^2	$\cdot$	73^1

c) The lcm of 13 and 20 is $260 = 2^2 \cdot 5 \cdot 13$.

The prime factorizations are: $13 = 13^1$, $20 = 2^2 \cdot 5^1$.

Determination of the list of all occurring prime factors:$\{2,5,13\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	13	$=$	2^0	$\cdot$	5^0	$\cdot$	13^1
Second number	20	$=$	2^2	$\cdot$	5^1	$\cdot$	13^0
Prime factor exponent			$2>0$		$1>0$		$1>0$
lcm	260	$=$	2^2	$\cdot$	5^1	$\cdot$	13^1

d) The lcm of 7 and 343 is $343 = 7^3$.

The prime factorizations are: $7 = 7^1$, $343 = 7^3$.

Determination of the list of all occurring prime factors:$\{7\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	7	=	7^1
Second number	343	=	7^3
Prime factor exponent			$3 > 1$
lcm	343	=	7^3

e) The lcm of 5 and 36 is $180 = 2^2 \cdot 3^2 \cdot 5$.

The prime factorizations are: $5 = 5^1$, $36 = 2^2 \cdot 3^2$.

Determination of the list of all occurring prime factors:$\{2,3,5\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	5	=	2^0	$\cdot$	3^0	$\cdot$	5^1
Second number	36	=	2^2	$\cdot$	3^2	$\cdot$	5^0
Prime factor exponent			$2 > 0$		$2 > 0$		$1 > 0$
lcm	180	=	2^2	$\cdot$	3^2	$\cdot$	5^1

f) The lcm of 26 and 169 is $338 = 2 \cdot 13^2$.

The prime factorizations are: $26 = 2^1 \cdot 13^1$, $169 = 13^2$.

Determination of the list of all occurring prime factors:$\{2,13\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	26	=	2^1	$\cdot$	13^1
Second number	169	=	2^0	$\cdot$	13^2
Prime factor exponent			$1 > 0$		$2 > 1$
lcm	338	=	2^1	$\cdot$	13^2

g) The lcm of 2 and 117 is $234 = 2 \cdot 3^2 \cdot 13$.

The prime factorizations are: $2 = 2^1$, $117 = 3^2 \cdot 13^1$.

Determination of the list of all occurring prime factors:$\{2,3,13\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	2	=	2^1	$\cdot$	3^0	$\cdot$	13^0
Second number	117	=	2^0	$\cdot$	3^2	$\cdot$	13^1
Prime factor exponent			$1 > 0$		$2 > 0$		$1 > 0$
lcm	234	=	2^1	$\cdot$	3^2	$\cdot$	13^1

h) The lcm of 2 and 95 is $190 = 2 \cdot 5 \cdot 19$.

The prime factorizations are: $2 = 2^1$, $95 = 5^1 \cdot 19^1$.

Determination of the list of all occurring prime factors:$\{2{,}5{,}19\}$

Determine the lcm by selecting the highest power for each prime factor:

First number	2	=	2^1	$\cdot$	5^0	$\cdot$	19^0
Second number	95	=	2^0	$\cdot$	5^1	$\cdot$	19^1
Prime factor exponent			$1 > 0$		$1 > 0$		$1 > 0$
lcm	190	=	2^1	$\cdot$	5^1	$\cdot$	19^1

Good Luck!