Worksheet

07/27/2020

Free on dw-math.com

Problem quickname: 3333

1) 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 2 and 964 is $964 = 2^2 \cdot 241$.

The prime factorizations are: $2 = 2^1$, $964 = 2^2 \cdot 241^1$.

Determination of the list of all occurring prime factors:{2,241}

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

First number	2	=	2^1	·	241^0
Second number	964	=	2^2	·	241^1
Prime factor exponent			$2 > 1$		$1 > 0$
lcm	964	=	2^2	·	241^1

b) The lcm of 3 and 292 is $876 = 2^2 \cdot 3 \cdot 73$.

The prime factorizations are: $3 = 3^1$, $292 = 2^2 \cdot 73^1$.

Determination of the list of all occurring prime factors:{2,3,73}

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

First number	3	=	2^0	·	3^1	·	73^0
Second number	292	=	2^2	·	3^0	·	73^1
Prime factor exponent			$2 > 0$		$1 > 0$		$1 > 0$
lcm	876	=	2^2	·	3^1	·	73^1

c) The lcm of 10 and 156 is $780 = 2^2 \cdot 3 \cdot 5 \cdot 13$.

The prime factorizations are: $10 = 2^1 \cdot 5^1$, $156 = 2^2 \cdot 3^1 \cdot 13^1$.

Determination of the list of all occurring prime factors:{2,3,5,13}

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

First number	10	=	2^1	·	3^0	·	5^1	·	13^0
Second number	156	=	2^2	·	3^1	·	5^0	·	13^1
Prime factor exponent			$2 > 1$		$1 > 0$		$1 > 0$		$1 > 0$
lcm	780	=	2^2	·	3^1	·	5^1	·	13^1

d) The lcm of 10 and 500 is $500 = 2^2 \cdot 5^3$.

The prime factorizations are: $10 = 2^1 \cdot 5^1$, $500 = 2^2 \cdot 5^3$.

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	10	=	2^1	$\cdot$	5^1
Second number	500	=	2^2	$\cdot$	5^3
Prime factor exponent			$2 > 1$		$3 > 1$
lcm	500	=	2^2	$\cdot$	5^3

e) The lcm of 32 and 432 is $864 = 2^5 \cdot 3^3$.

The prime factorizations are: $32 = 2^5$, $432 = 2^4 \cdot 3^3$.

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	32	=	2^5	$\cdot$	3^0
Second number	432	=	2^4	$\cdot$	3^3
Prime factor exponent			$5 > 4$		$3 > 0$
lcm	864	=	2^5	$\cdot$	3^3

f) The lcm of 6 and 127 is $762 = 2 \cdot 3 \cdot 127$.

The prime factorizations are: $6 = 2^1 \cdot 3^1$, $127 = 127^1$.

Determination of the list of all occurring prime factors:$\{2,3,127\}$

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

First number	6	=	2^1	$\cdot$	3^1	$\cdot$	127^0
Second number	127	=	2^0	$\cdot$	3^0	$\cdot$	127^1
Prime factor exponent			$1 > 0$		$1 > 0$		$1 > 0$
lcm	762	=	2^1	$\cdot$	3^1	$\cdot$	127^1

g) The lcm of 4 and 249 is $996 = 2^2 \cdot 3 \cdot 83$.

The prime factorizations are: $4 = 2^2$, $249 = 3^1 \cdot 83^1$.

Determination of the list of all occurring prime factors:$\{2,3,83\}$

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

First number	4	=	2^2	$\cdot$	3^0	$\cdot$	83^0
Second number	249	=	2^0	$\cdot$	3^1	$\cdot$	83^1
Prime factor exponent			$2 > 0$		$1 > 0$		$1 > 0$
lcm	996	=	2^2	$\cdot$	3^1	$\cdot$	83^1

h) The lcm of 2 and 377 is $754 = 2 \cdot 13 \cdot 29$.

The prime factorizations are: $2 = 2^1$, $377 = 13^1 \cdot 29^1$.

Determination of the list of all occurring prime factors: $\{2,13,29\}$

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

First number	2	=	2^1	$\cdot$	13^0	$\cdot$	29^0
Second number	377	=	2^0	$\cdot$	13^1	$\cdot$	29^1
Prime factor exponent			$1 > 0$		$1 > 0$		$1 > 0$
lcm	754	=	2^1	$\cdot$	13^1	$\cdot$	29^1

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 75 and 90 is $450 = 2 \cdot 3^2 \cdot 5^2$.

The prime factorizations are: $75 = 3^1 \cdot 5^2$, $90 = 2^1 \cdot 3^2 \cdot 5^1$.

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	75	=	2^0	$\cdot$	3^1	$\cdot$	5^2
Second number	90	=	2^1	$\cdot$	3^2	$\cdot$	5^1
Prime factor exponent			$1 > 0$		$2 > 1$		$2 > 1$
lcm	450	=	2^1	$\cdot$	3^2	$\cdot$	5^2

b) The lcm of 4 and 496 is $496 = 2^4 \cdot 31$.

The prime factorizations are: $4 = 2^2$, $496 = 2^4 \cdot 31^1$.

Determination of the list of all occurring prime factors: $\{2,31\}$

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

First number	4	=	2^2	$\cdot$	31^0
Second number	496	=	2^4	$\cdot$	31^1
Prime factor exponent			$4 > 2$		$1 > 0$
lcm	496	=	2^4	$\cdot$	31^1

c) The lcm of 3 and 161 is $483 = 3 \cdot 7 \cdot 23$.

The prime factorizations are: $3 = 3^1$, $161 = 7^1 \cdot 23^1$.

Determination of the list of all occurring prime factors: $\{3,7,23\}$

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

First number	3	=	3^1	$\cdot$	7^0	$\cdot$	23^0
Second number	161	=	3^0	$\cdot$	7^1	$\cdot$	23^1
Prime factor exponent			$1 > 0$		$1 > 0$		$1 > 0$
lcm	483	=	3^1	$\cdot$	7^1	$\cdot$	23^1

d) The lcm of 3 and 92 is $276 = 2^2 \cdot 3 \cdot 23$.

The prime factorizations are: $3 = 3^1$, $92 = 2^2 \cdot 23^1$.

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	3	=	2^0	·	3^1	·	23^0
Second number	92	=	2^2	·	3^0	·	23^1
Prime factor exponent			$2 > 0$		$1 > 0$		$1 > 0$
lcm	276	=	2^2	·	3^1	·	23^1

e) The lcm of 5 and 33 is $165 = 3 \cdot 5 \cdot 11$.

The prime factorizations are: $5 = 5^1$, $33 = 3^1 \cdot 11^1$.

Determination of the list of all occurring prime factors:{3,5,11}

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

First number	5	=	3^0	·	5^1	·	11^0
Second number	33	=	3^1	·	5^0	·	11^1
Prime factor exponent			$1 > 0$		$1 > 0$		$1 > 0$
lcm	165	=	3^1	·	5^1	·	11^1

f) The lcm of 10 and 500 is $500 = 2^2 \cdot 5^3$.

The prime factorizations are: $10 = 2^1 \cdot 5^1$, $500 = 2^2 \cdot 5^3$.

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	10	=	2^1	·	5^1
Second number	500	=	2^2	·	5^3
Prime factor exponent			$2 > 1$		$3 > 1$
lcm	500	=	2^2	·	5^3

g) The lcm of 15 and 99 is $495 = 3^2 \cdot 5 \cdot 11$.

The prime factorizations are: $15 = 3^1 \cdot 5^1$, $99 = 3^2 \cdot 11^1$.

Determination of the list of all occurring prime factors:{3,5,11}

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

First number	15	=	3^1	·	5^1	·	11^0
Second number	99	=	3^2	·	5^0	·	11^1
Prime factor exponent			$2 > 1$		$1 > 0$		$1 > 0$
lcm	495	=	3^2	·	5^1	·	11^1

h) The lcm of 3 and 134 is $402 = 2 \cdot 3 \cdot 67$.

The prime factorizations are: $3 = 3^1$, $134 = 2^1 \cdot 67^1$.

Determination of the list of all occurring prime factors:$\{2,3,67\}$

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

First number	3	$=$	2^0	$\cdot$	3^1	$\cdot$	67^0
Second number	134	$=$	2^1	$\cdot$	3^0	$\cdot$	67^1
Prime factor exponent			$1 > 0$		$1 > 0$		$1 > 0$
lcm	402	$=$	2^1	$\cdot$	3^1	$\cdot$	67^1

3)

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 39 is $78 = 2 \cdot 3 \cdot 13$.

The prime factorizations are: $2 = 2^1$, $39 = 3^1 \cdot 13^1$.

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	39	$=$	2^0	$\cdot$	3^1	$\cdot$	13^1
Prime factor exponent			$1 > 0$		$1 > 0$		$1 > 0$
lcm	78	$=$	2^1	$\cdot$	3^1	$\cdot$	13^1

b) The lcm of 2 and 35 is $70 = 2 \cdot 5 \cdot 7$.

The prime factorizations are: $2 = 2^1$, $35 = 5^1 \cdot 7^1$.

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	2	$=$	2^1	$\cdot$	5^0	$\cdot$	7^0
Second number	35	$=$	2^0	$\cdot$	5^1	$\cdot$	7^1
Prime factor exponent			$1 > 0$		$1 > 0$		$1 > 0$
lcm	70	$=$	2^1	$\cdot$	5^1	$\cdot$	7^1

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 3 and 45 is $45 = 3^2 \cdot 5$.

The prime factorizations are: $3 = 3^1$, $45 = 3^2 \cdot 5^1$.

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

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

First number	3	=	3^1	·	5^0
Second number	45	=	3^2	·	5^1
Prime factor exponent			$2>1$		$1>0$
lcm	45	=	3^2	·	5^1

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 84 is $84 = 2^2 \cdot 3 \cdot 7$.

The prime factorizations are: $2 = 2^1$, $84 = 2^2 \cdot 3^1 \cdot 7^1$.

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	2	=	2^1	·	3^0	·	7^0
Second number	84	=	2^2	·	3^1	·	7^1
Prime factor exponent			$2>1$		$1>0$		$1>0$
lcm	84	=	2^2	·	3^1	·	7^1

g) The lcm of 8 and 22 is $88 = 2^3 \cdot 11$.

The prime factorizations are: $8 = 2^3$, $22 = 2^1 \cdot 11^1$.

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

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

First number	8	=	2^3	·	11^0
Second number	22	=	2^1	·	11^1
Prime factor exponent			$3>1$		$1>0$
lcm	88	=	2^3	·	11^1

h) The lcm of 2 and 49 is $98 = 2 \cdot 7^2$.

The prime factorizations are: $2 = 2^1$, $49 = 7^2$.

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	2	=	2^1	$\cdot$	7^0
Second number	49	=	2^0	$\cdot$	7^2
Prime factor exponent			$1 > 0$		$2 > 0$
lcm	98	=	2^1	$\cdot$	7^2

4)

Determine the lcm, the least common multiple, of the two numbers. Find the prime factorizations and derive the lcm. Quick: 3333

a) The lcm of 5 and 141 is $705 = 3 \cdot 5 \cdot 47$.

The prime factorizations are: $5 = 5^1$, $141 = 3^1 \cdot 47^1$.

Determination of the list of all occurring prime factors:$\{3,5,47\}$

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

First number	5	=	3^0	$\cdot$	5^1	$\cdot$	47^0
Second number	141	=	3^1	$\cdot$	5^0	$\cdot$	47^1
Prime factor exponent			$1 > 0$		$1 > 0$		$1 > 0$
lcm	705	=	3^1	$\cdot$	5^1	$\cdot$	47^1

b) The lcm of 18 and 19 is $342 = 2 \cdot 3^2 \cdot 19$.

The prime factorizations are: $18 = 2^1 \cdot 3^2$, $19 = 19^1$.

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	18	=	2^1	$\cdot$	3^2	$\cdot$	19^0
Second number	19	=	2^0	$\cdot$	3^0	$\cdot$	19^1
Prime factor exponent			$1 > 0$		$2 > 0$		$1 > 0$
lcm	342	=	2^1	$\cdot$	3^2	$\cdot$	19^1

c) The lcm of 14 and 31 is $434 = 2 \cdot 7 \cdot 31$.

The prime factorizations are: $14 = 2^1 \cdot 7^1$, $31 = 31^1$.

Determination of the list of all occurring prime factors:$\{2,7,31\}$

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

First number	14	=	2^1	$\cdot$	7^1	$\cdot$	31^0
Second number	31	=	2^0	$\cdot$	7^0	$\cdot$	31^1
Prime factor exponent			$1 > 0$		$1 > 0$		$1 > 0$
lcm	434	=	2^1	$\cdot$	7^1	$\cdot$	31^1

d) The lcm of 8 and 284 is $568 = 2^3 \cdot 71$.

The prime factorizations are: $8 = 2^3$, $284 = 2^2 \cdot 71^1$.

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

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

First number	8	=	2^3	·	71^0
Second number	284	=	2^2	·	71^1
Prime factor exponent			$3 > 2$		$1 > 0$
lcm	568	=	2^3	·	71^1

e) The lcm of 2 and 361 is $722 = 2 \cdot 19^2$.

The prime factorizations are: $2 = 2^1$, $361 = 19^2$.

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

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

First number	2	=	2^1	·	19^0
Second number	361	=	2^0	·	19^2
Prime factor exponent			$1 > 0$		$2 > 0$
lcm	722	=	2^1	·	19^2

f) The lcm of 3 and 254 is $762 = 2 \cdot 3 \cdot 127$.

The prime factorizations are: $3 = 3^1$, $254 = 2^1 \cdot 127^1$.

Determination of the list of all occurring prime factors:{2,3,127}

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

First number	3	=	2^0	·	3^1	·	127^0
Second number	254	=	2^1	·	3^0	·	127^1
Prime factor exponent			$1 > 0$		$1 > 0$		$1 > 0$
lcm	762	=	2^1	·	3^1	·	127^1

g) The lcm of 10 and 128 is $640 = 2^7 \cdot 5$.

The prime factorizations are: $10 = 2^1 \cdot 5^1$, $128 = 2^7$.

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	10	=	2^1	·	5^1
Second number	128	=	2^7	·	5^0
Prime factor exponent			$7 > 1$		$1 > 0$
lcm	640	=	2^7	·	5^1

h) The lcm of 32 and 120 is $480 = 2^5 \cdot 3 \cdot 5$.

The prime factorizations are: $32 = 2^5$, $120 = 2^3 \cdot 3^1 \cdot 5^1$.

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	32	$=$	2^5	$\cdot$	3^0	$\cdot$	5^0
Second number	120	$=$	2^3	$\cdot$	3^1	$\cdot$	5^1
Prime factor exponent			$5 > 3$		$1 > 0$		$1 > 0$
lcm	480	$=$	2^5	$\cdot$	3^1	$\cdot$	5^1

Good Luck!