Worksheet

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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 40 is $40 = 2^3 \cdot 5$.

The prime factorizations are: $4 = 2^2$, $40 = 2^3 \cdot 5^1$.

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	4	=	2^2	$\cdot$	5^0
Second number	40	=	2^3	$\cdot$	5^1
Prime factor exponent			$3 > 2$		$1 > 0$
lcm	40	=	2^3	$\cdot$	5^1

b) The lcm of 8 and 10 is $40 = 2^3 \cdot 5$.

The prime factorizations are: $8 = 2^3$, $10 = 2^1 \cdot 5^1$.

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	8	=	2^3	$\cdot$	5^0
Second number	10	=	2^1	$\cdot$	5^1
Prime factor exponent			$3 > 1$		$1 > 0$
lcm	40	=	2^3	$\cdot$	5^1

c) The lcm of 5 and 50 is $50 = 2 \cdot 5^2$.

The prime factorizations are: $5 = 5^1$, $50 = 2^1 \cdot 5^2$.

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	5	=	2^0	$\cdot$	5^1
Second number	50	=	2^1	$\cdot$	5^2
Prime factor exponent			$1 > 0$		$2 > 1$
lcm	50	=	2^1	$\cdot$	5^2

d) The lcm of 3 and 54 is $54 = 2 \cdot 3^3$.

The prime factorizations are: $3 = 3^1$, $54 = 2^1 \cdot 3^3$.

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	3	=	2^0	$\cdot$	3^1
Second number	54	=	2^1	$\cdot$	3^3
Prime factor exponent			$1 > 0$		$3 > 1$
lcm	54	=	2^1	$\cdot$	3^3

e) The lcm of 8 and 12 is $24 = 2^3 \cdot 3$.

The prime factorizations are: $8 = 2^3$, $12 = 2^2 \cdot 3^1$.

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	8	=	2^3	$\cdot$	3^0
Second number	12	=	2^2	$\cdot$	3^1
Prime factor exponent			$3 > 2$		$1 > 0$
lcm	24	=	2^3	$\cdot$	3^1

f) The lcm of 9 and 33 is $99 = 3^2 \cdot 11$.

The prime factorizations are: $9 = 3^2$, $33 = 3^1 \cdot 11^1$.

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

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

First number	9	=	3^2	$\cdot$	11^0
Second number	33	=	3^1	$\cdot$	11^1
Prime factor exponent			$2 > 1$		$1 > 0$
lcm	99	=	3^2	$\cdot$	11^1

g) The lcm of 2 and 52 is $52 = 2^2 \cdot 13$.

The prime factorizations are: $2 = 2^1$, $52 = 2^2 \cdot 13^1$.

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	2	=	2^1	$\cdot$	13^0
Second number	52	=	2^2	$\cdot$	13^1
Prime factor exponent			$2 > 1$		$1 > 0$
lcm	52	=	2^2	$\cdot$	13^1

h) The lcm of 8 and 18 is $72 = 2^3 \cdot 3^2$.

The prime factorizations are: $8 = 2^3$, $18 = 2^1 \cdot 3^2$.

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	8	=	2^3	$\cdot$	3^0
Second number	18	=	2^1	$\cdot$	3^2
Prime factor exponent			$3 > 1$		$2 > 0$
lcm	72	=	2^3	$\cdot$	3^2

2) 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 8 and 78 is $312 = 2^3 \cdot 3 \cdot 13$.

The prime factorizations are: $8 = 2^3$, $78 = 2^1 \cdot 3^1 \cdot 13^1$.

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	8	=	2^3	$\cdot$	3^0	$\cdot$	13^0
Second number	78	=	2^1	$\cdot$	3^1	$\cdot$	13^1
Prime factor exponent			$3 > 1$		$1 > 0$		$1 > 0$
lcm	312	=	2^3	$\cdot$	3^1	$\cdot$	13^1

b) The lcm of 2 and 352 is $352 = 2^5 \cdot 11$.

The prime factorizations are: $2 = 2^1$, $352 = 2^5 \cdot 11^1$.

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	2	=	2^1	$\cdot$	11^0
Second number	352	=	2^5	$\cdot$	11^1
Prime factor exponent			$5 > 1$		$1 > 0$
lcm	352	=	2^5	$\cdot$	11^1

c) The lcm of 28 and 50 is $700 = 2^2 \cdot 5^2 \cdot 7$.

The prime factorizations are: $28 = 2^2 \cdot 7^1$, $50 = 2^1 \cdot 5^2$.

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	28	=	2^2	$\cdot$	5^0	$\cdot$	7^1
Second number	50	=	2^1	$\cdot$	5^2	$\cdot$	7^0
Prime factor exponent			$2 > 1$		$2 > 0$		$1 > 0$
lcm	700	=	2^2	$\cdot$	5^2	$\cdot$	7^1

d) The lcm of 9 and 141 is $423 = 3^2 \cdot 47$.

The prime factorizations are: $9 = 3^2$, $141 = 3^1 \cdot 47^1$.

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

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

First number	9	$=$	3^2	$\cdot$	47^0
Second number	141	$=$	3^1	$\cdot$	47^1
Prime factor exponent			$2 > 1$		$1 > 0$
lcm	423	$=$	3^2	$\cdot$	47^1

e) The lcm of 2 and 732 is $732 = 2^2 \cdot 3 \cdot 61$.

The prime factorizations are: $2 = 2^1$, $732 = 2^2 \cdot 3^1 \cdot 61^1$.

Determination of the list of all occurring prime factors:{2,3,61}

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

First number	2	$=$	2^1	$\cdot$	3^0	$\cdot$	61^0
Second number	732	$=$	2^2	$\cdot$	3^1	$\cdot$	61^1
Prime factor exponent			$2 > 1$		$1 > 0$		$1 > 0$
lcm	732	$=$	2^2	$\cdot$	3^1	$\cdot$	61^1

f) The lcm of 10 and 88 is $440 = 2^3 \cdot 5 \cdot 11$.

The prime factorizations are: $10 = 2^1 \cdot 5^1$, $88 = 2^3 \cdot 11^1$.

Determination of the list of all occurring prime factors:{2,5,11}

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

First number	10	$=$	2^1	$\cdot$	5^1	$\cdot$	11^0
Second number	88	$=$	2^3	$\cdot$	5^0	$\cdot$	11^1
Prime factor exponent			$3 > 1$		$1 > 0$		$1 > 0$
lcm	440	$=$	2^3	$\cdot$	5^1	$\cdot$	11^1

g) The lcm of 4 and 350 is $700 = 2^2 \cdot 5^2 \cdot 7$.

The prime factorizations are: $4 = 2^2$, $350 = 2^1 \cdot 5^2 \cdot 7^1$.

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	4	$=$	2^2	$\cdot$	5^0	$\cdot$	7^0
Second number	350	$=$	2^1	$\cdot$	5^2	$\cdot$	7^1
Prime factor exponent			$2 > 1$		$2 > 0$		$1 > 0$
lcm	700	$=$	2^2	$\cdot$	5^2	$\cdot$	7^1

h) The lcm of 14 and 588 is $588 = 2^2 \cdot 3 \cdot 7^2$.

The prime factorizations are: $14 = 2^1 \cdot 7^1$, $588 = 2^2 \cdot 3^1 \cdot 7^2$.

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	14	=	2^1	$\cdot$	3^0	$\cdot$	7^1
Second number	588	=	2^2	$\cdot$	3^1	$\cdot$	7^2
Prime factor exponent			$2>1$		$1>0$		$2>1$
lcm	588	=	2^2	$\cdot$	3^1	$\cdot$	7^2

3)

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

a) The lcm of 8 and 23 is $184 = 2^3 \cdot 23$.

The prime factorizations are: $8 = 2^3$, $23 = 23^1$.

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

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

First number	8	=	2^3	$\cdot$	23^0
Second number	23	=	2^0	$\cdot$	23^1
Prime factor exponent			$3>0$		$1>0$
lcm	184	=	2^3	$\cdot$	23^1

b) The lcm of 2 and 143 is $286 = 2 \cdot 11 \cdot 13$.

The prime factorizations are: $2 = 2^1$, $143 = 11^1 \cdot 13^1$.

Determination of the list of all occurring prime factors:$\{2,11,13\}$

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

First number	2	=	2^1	$\cdot$	11^0	$\cdot$	13^0
Second number	143	=	2^0	$\cdot$	11^1	$\cdot$	13^1
Prime factor exponent			$1>0$		$1>0$		$1>0$
lcm	286	=	2^1	$\cdot$	11^1	$\cdot$	13^1

c) The lcm of 9 and 43 is $387 = 3^2 \cdot 43$.

The prime factorizations are: $9 = 3^2$, $43 = 43^1$.

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

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

First number	9	=	3^2	$\cdot$	43^0
Second number	43	=	3^0	$\cdot$	43^1
Prime factor exponent			$2>0$		$1>0$
lcm	387	=	3^2	$\cdot$	43^1

d) The lcm of 2 and 177 is $354 = 2 \cdot 3 \cdot 59$.

The prime factorizations are: $2 = 2^1$, $177 = 3^1 \cdot 59^1$.

Determination of the list of all occurring prime factors:{2,3,59}

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

First number	2	=	2^1	$\cdot$	3^0	$\cdot$	59^0
Second number	177	=	2^0	$\cdot$	3^1	$\cdot$	59^1
Prime factor exponent			$1 > 0$		$1 > 0$		$1 > 0$
lcm	354	=	2^1	$\cdot$	3^1	$\cdot$	59^1

e) The lcm of 6 and 35 is $210 = 2 \cdot 3 \cdot 5 \cdot 7$.

The prime factorizations are: $6 = 2^1 \cdot 3^1$, $35 = 5^1 \cdot 7^1$.

Determination of the list of all occurring prime factors:{2,3,5,7}

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

First number	6	=	2^1	$\cdot$	3^1	$\cdot$	5^0	$\cdot$	7^0
Second number	35	=	2^0	$\cdot$	3^0	$\cdot$	5^1	$\cdot$	7^1
Prime factor exponent			$1 > 0$		$1 > 0$		$1 > 0$		$1 > 0$
lcm	210	=	2^1	$\cdot$	3^1	$\cdot$	5^1	$\cdot$	7^1

f) The lcm of 2 and 152 is $152 = 2^3 \cdot 19$.

The prime factorizations are: $2 = 2^1$, $152 = 2^3 \cdot 19^1$.

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	$\cdot$	19^0
Second number	152	=	2^3	$\cdot$	19^1
Prime factor exponent			$3 > 1$		$1 > 0$
lcm	152	=	2^3	$\cdot$	19^1

g) The lcm of 12 and 117 is $468 = 2^2 \cdot 3^2 \cdot 13$.

The prime factorizations are: $12 = 2^2 \cdot 3^1$, $117 = 3^2 \cdot 13^1$.

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	12	=	2^2	$\cdot$	3^1	$\cdot$	13^0
Second number	117	=	2^0	$\cdot$	3^2	$\cdot$	13^1
Prime factor exponent			$2 > 0$		$2 > 1$		$1 > 0$
lcm	468	=	2^2	$\cdot$	3^2	$\cdot$	13^1

h) The lcm of 2 and 217 is $434 = 2 \cdot 7 \cdot 31$.

The prime factorizations are: $2 = 2^1$, $217 = 7^1 \cdot 31^1$.

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	2	=	2^1	$\cdot$	7^0	$\cdot$	31^0
Second number	217	=	2^0	$\cdot$	7^1	$\cdot$	31^1
Prime factor exponent			$1 > 0$		$1 > 0$		$1 > 0$
lcm	434	=	2^1	$\cdot$	7^1	$\cdot$	31^1

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 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

b) The lcm of 5 and 9 is $45 = 3^2 \cdot 5$.

The prime factorizations are: $5 = 5^1$, $9 = 3^2$.

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	5	=	3^0	$\cdot$	5^1
Second number	9	=	3^2	$\cdot$	5^0
Prime factor exponent			$2 > 0$		$1 > 0$
lcm	45	=	3^2	$\cdot$	5^1

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

The prime factorizations are: $2 = 2^1$, $88 = 2^3 \cdot 11^1$.

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	2	=	2^1	$\cdot$	11^0
Second number	88	=	2^3	$\cdot$	11^1
Prime factor exponent			$3 > 1$		$1 > 0$
lcm	88	=	2^3	$\cdot$	11^1

d) The lcm of 4 and 23 is $92 = 2^2 \cdot 23$.

The prime factorizations are: $4 = 2^2$, $23 = 23^1$.

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

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

First number	4	=	2^2	$\cdot$	23^0
Second number	23	=	2^0	$\cdot$	23^1
Prime factor exponent			$2 > 0$		$1 > 0$
lcm	92	=	2^2	$\cdot$	23^1

e) The lcm of 3 and 26 is $78 = 2 \cdot 3 \cdot 13$.

The prime factorizations are: $3 = 3^1$, $26 = 2^1 \cdot 13^1$.

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	3	=	2^0	$\cdot$	3^1	$\cdot$	13^0
Second number	26	=	2^1	$\cdot$	3^0	$\cdot$	13^1
Prime factor exponent			$1 > 0$		$1 > 0$		$1 > 0$
lcm	78	=	2^1	$\cdot$	3^1	$\cdot$	13^1

f) The lcm of 27 and 81 is $81 = 3^4$.

The prime factorizations are: $27 = 3^3$, $81 = 3^4$.

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

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

First number	27	=	3^3
Second number	81	=	3^4
Prime factor exponent			$4 > 3$
lcm	81	=	3^4

g) The lcm of 4 and 34 is $68 = 2^2 \cdot 17$.

The prime factorizations are: $4 = 2^2$, $34 = 2^1 \cdot 17^1$.

Determination of the list of all occurring prime factors:{2,17}

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

First number	4	=	2^2	$\cdot$	17^0
Second number	34	=	2^1	$\cdot$	17^1
Prime factor exponent			$2 > 1$		$1 > 0$
lcm	68	=	2^2	$\cdot$	17^1

h) The lcm of 9 and 81 is $81 = 3^4$.

The prime factorizations are: $9 = 3^2$, $81 = 3^4$.

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	81	=	3^4
Prime factor exponent			$4 > 2$
lcm	81	=	3^4

Good Luck!