

Correction : Partie 1

Niveau 1 :

Nous allons décomposer les nombres de l'exercice dans l'ordre.

Vous pouvez bien évidemment, commencer vos décompositions pas un autre nombre.

N'oublions pas que la multiplication est commutative !

$\begin{array}{l} 4 \\ 2 \\ 1 \end{array} \Bigg \begin{array}{l} 2 \\ 2 \\ \end{array}$	$\begin{array}{l} 9 \\ 3 \\ 1 \end{array} \Bigg \begin{array}{l} 3 \\ 3 \\ \end{array}$	$\begin{array}{l} 15 \\ 5 \\ 1 \end{array} \Bigg \begin{array}{l} 3 \\ 5 \\ \end{array}$	$\begin{array}{l} 20 \\ 10 \\ 5 \\ 1 \end{array} \Bigg \begin{array}{l} 2 \\ 2 \\ 5 \\ \end{array}$	$\begin{array}{l} 30 \\ 6 \\ 3 \\ 1 \end{array} \Bigg \begin{array}{l} 5 \\ 2 \\ 3 \\ \end{array}$	$\begin{array}{l} 50 \\ 10 \\ 2 \\ 1 \end{array} \Bigg \begin{array}{l} 5 \\ 5 \\ 2 \\ \end{array}$	$\begin{array}{l} 26 \\ 13 \\ 1 \end{array} \Bigg \begin{array}{l} 2 \\ 13 \\ \end{array}$
$4 = 2 \times 2$	$9 = 3 \times 3$	$15 = 3 \times 5$	$20 = 2 \times 2 \times 5$	$30 = 5 \times 2 \times 3$	$50 = 5 \times 5 \times 2$	$26 = 2 \times 13$

$\begin{array}{l} 3_1 2 \\ 1 6 \\ 8 \\ 4 \\ 2 \\ 1 \end{array} \Bigg \begin{array}{l} 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ \end{array}$	$\begin{array}{l} 36 \\ 12 \\ 6 \\ 2 \\ 1 \end{array} \Bigg \begin{array}{l} 3 \\ 2 \\ 3 \\ 2 \\ \end{array}$	$\begin{array}{l} 24 \\ 12 \\ 6 \\ 3 \\ 1 \end{array} \Bigg \begin{array}{l} 2 \\ 2 \\ 2 \\ 3 \\ \end{array}$	$\begin{array}{l} 16 \\ 8 \\ 4 \\ 2 \\ 1 \end{array} \Bigg \begin{array}{l} 2 \\ 2 \\ 2 \\ 2 \\ \end{array}$	$\begin{array}{l} 14 \\ 7 \\ 1 \end{array} \Bigg \begin{array}{l} 2 \\ 7 \\ \end{array}$	$\begin{array}{l} 10 \\ 2 \\ 1 \end{array} \Bigg \begin{array}{l} 5 \\ 2 \\ \end{array}$	$\begin{array}{l} 25 \\ 5 \\ 1 \end{array} \Bigg \begin{array}{l} 5 \\ 5 \\ \end{array}$
$36 = 3 \times 2 \times 3 \times 2$	$24 = 2 \times 2 \times 2 \times 3$	$16 = 2 \times 2 \times 2 \times 2$	$14 = 2 \times 7$	$10 = 5 \times 2$	$25 = 5 \times 5$	

$32 = 2 \times 2 \times 2 \times 2 \times 2$

$\begin{array}{l} 35 \\ 7 \\ 1 \end{array} \Bigg \begin{array}{l} 5 \\ 7 \\ \end{array}$	$\begin{array}{l} 21 \\ 7 \\ 1 \end{array} \Bigg \begin{array}{l} 3 \\ 7 \\ \end{array}$	$\begin{array}{l} 42 \\ 21 \\ 7 \\ 1 \end{array} \Bigg \begin{array}{l} 2 \\ 3 \\ 7 \\ \end{array}$	$\begin{array}{l} 28 \\ 14 \\ 7 \\ 1 \end{array} \Bigg \begin{array}{l} 2 \\ 2 \\ 7 \\ \end{array}$	$\begin{array}{l} 27 \\ 9 \\ 3 \\ 1 \end{array} \Bigg \begin{array}{l} 3 \\ 3 \\ 3 \\ \end{array}$	$\begin{array}{l} 48 \\ 24 \\ 12 \\ 6 \\ 3 \\ 1 \end{array} \Bigg \begin{array}{l} 2 \\ 2 \\ 2 \\ 2 \\ 3 \\ \end{array}$	$\begin{array}{l} 5_1 4 \\ 2 7 \\ 9 \\ 3 \\ 1 \end{array} \Bigg \begin{array}{l} 2 \\ 3 \\ 3 \\ 3 \\ \end{array}$
$35 = 5 \times 7$	$21 = 3 \times 7$	$42 = 2 \times 3 \times 7$	$28 = 2 \times 2 \times 7$	$27 = 3 \times 3 \times 3$	$48 = 2 \times 2 \times 2 \times 2 \times 3$	$54 = 2 \times 3 \times 3 \times 3$

$\begin{array}{l} 18 \\ 6 \\ 2 \\ 1 \end{array} \Bigg \begin{array}{l} 3 \\ 3 \\ 2 \\ \end{array}$	$\begin{array}{l} 5_1 6 \\ 2 8 \\ 14 \\ 7 \\ 1 \end{array} \Bigg \begin{array}{l} 2 \\ 2 \\ 2 \\ 7 \\ \end{array}$	$\begin{array}{l} 7_1 2 \\ 3 6 \\ 1 2 \\ 4 \\ 2 \\ 1 \end{array} \Bigg \begin{array}{l} 2 \\ 3 \\ 3 \\ 2 \\ 2 \\ \end{array}$	$\begin{array}{l} 63 \\ 21 \\ 7 \\ 1 \end{array} \Bigg \begin{array}{l} 3 \\ 3 \\ 7 \\ \end{array}$	$\begin{array}{l} 6 4 \\ 3_1 2 \\ 1 6 \\ 8 \\ 4 \\ 2 \\ 1 \end{array} \Bigg \begin{array}{l} 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ \end{array}$	$\begin{array}{l} 80 \\ 40 \\ 20 \\ 10 \\ 5 \\ 1 \end{array} \Bigg \begin{array}{l} 2 \\ 2 \\ 2 \\ 2 \\ 5 \\ \end{array}$
$18 = 3 \times 3 \times 2$	$56 = 2 \times 2 \times 2 \times 7$	$72 = 2 \times 3 \times 3 \times 2 \times 2$	$63 = 3 \times 3 \times 7$	$64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2$	$80 = 2 \times 2 \times 2 \times 2 \times 5$

$64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2$

$$\begin{array}{r|l} 12 & 2 \\ 6 & 3 \\ 2 & 2 \\ 1 & \end{array}$$

$12 = 2 \times 2 \times 3$

$$\begin{array}{r|l} 45 & 5 \\ 9 & 3 \\ 3 & 3 \\ 1 & \end{array}$$

$45 = 5 \times 3 \times 3$

$$\begin{array}{r|l} 150 & 5 \\ 30 & 5 \\ 6 & 2 \\ 3 & 3 \\ 1 & \end{array}$$

$150 = 5 \times 5 \times 2 \times 3$

$$\begin{array}{r|l} 300 & 5 \\ 6_10 & 5 \\ 12 & 2 \\ 6 & 3 \\ 2 & 2 \\ 1 & \end{array}$$

$300 = 5 \times 5 \times 2 \times 3 \times 2$

$$\begin{array}{r|l} 200 & 2 \\ 100 & 2 \\ 50 & 5 \\ 10 & 2 \\ 5 & 5 \\ 1 & \end{array}$$

$200 = 2 \times 2 \times 5 \times 2 \times 5$

$$\begin{array}{r|l} 500 & 5 \\ 100 & 5 \\ 20 & 5 \\ 4 & 2 \\ 2 & 2 \\ 1 & \end{array}$$

$500 = 5 \times 5 \times 5 \times 2 \times 2$

Niveau 2 :

$$\begin{array}{r|l} 3_16 & 2 \\ 18 & 3 \\ 6 & 2 \\ 3 & 3 \\ 1 & \end{array}$$

$36 = 2 \times 3 \times 2 \times 3$

$$\begin{array}{r|l} 100 & 2 \\ 50 & 2 \\ 25 & 5 \\ 5 & 5 \\ 1 & \end{array}$$

$100 = 2 \times 2 \times 5 \times 5$

$$\begin{array}{r|l} 180 & 3 \\ 6_10 & 5 \\ 12 & 3 \\ 4 & 2 \\ 2 & 2 \\ 1 & \end{array}$$

$180 = 3 \times 5 \times 3 \times 2 \times 2$

$$\begin{array}{r|l} 22_25 & 5 \\ 45 & 5 \\ 9 & 3 \\ 3 & 3 \\ 1 & \end{array}$$

$225 = 5 \times 5 \times 3 \times 3$

$$\begin{array}{r|l} 13_35 & 5 \\ 27 & 3 \\ 9 & 3 \\ 3 & 3 \\ 1 & \end{array}$$

$135 = 5 \times 3 \times 3 \times 3$

$$\begin{array}{r|l} 450 & 5 \\ 9_40 & 5 \\ 18 & 2 \\ 9 & 3 \\ 3 & 3 \\ 1 & \end{array}$$

$450 = 5 \times 5 \times 2 \times 3 \times 3$

$$\begin{array}{r|l} 40 & 2 \\ 20 & 2 \\ 10 & 2 \\ 5 & 5 \\ 1 & \end{array}$$

$40 = 2 \times 2 \times 2 \times 5$

$$\begin{array}{r|l} 4_15 & 3 \\ 15 & 3 \\ 5 & 5 \\ 1 & \end{array}$$

$45 = 3 \times 3 \times 5$

$$\begin{array}{r|l} 120 & 2 \\ 60 & 2 \\ 3_10 & 2 \\ 15 & 3 \\ 5 & 5 \\ 1 & \end{array}$$

$120 = 2 \times 2 \times 2 \times 3 \times 5$

$$\begin{array}{r|l} 7_12 & 2 \\ 3_16 & 2 \\ 18 & 3 \\ 6 & 3 \\ 2 & 2 \\ 1 & \end{array}$$

$72 = 2 \times 2 \times 3 \times 3 \times 2$

$$\begin{array}{r|l} 108 & 2 \\ 5_14 & 2 \\ 27 & 3 \\ 9 & 3 \\ 3 & 3 \\ 1 & \end{array}$$

$108 = 2 \times 2 \times 3 \times 3 \times 3$

$$\begin{array}{r|l} 21_16 & 2 \\ 108 & 2 \\ 5_14 & 2 \\ 27 & 3 \\ 9 & 3 \\ 3 & 3 \\ 1 & \end{array}$$

$216 = 2 \times 2 \times 2 \times 3 \times 3 \times 3$

$$\begin{array}{r|l} 360 & 3 \\ 12_20 & 5 \\ 24 & 2 \\ 12 & 2 \\ 6 & 3 \\ 2 & 2 \\ 1 & \end{array}$$

$360 = 3 \times 5 \times 2 \times 2 \times 2 \times 3$

$$\begin{array}{r|l} 9_400 & 5 \\ 18_30 & 5 \\ 36 & 3 \\ 12 & 3 \\ 4 & 2 \\ 2 & 2 \\ 1 & \end{array}$$

$540 = 3 \times 3 \times 5 \times 3 \times 2 \times 2$

$$\begin{array}{r|l} 5_240 & 3 \\ 180 & 3 \\ 6_10 & 5 \\ 12 & 3 \\ 4 & 2 \\ 2 & 2 \\ 1 & \end{array}$$

$$\begin{array}{r|l} 7_120 & 3 \\ 24_40 & 5 \\ 4_18 & 3 \\ 16 & 2 \\ 8 & 2 \\ 4 & 2 \\ 2 & 2 \\ 1 & \end{array}$$

$720 = 3 \times 5 \times 3 \times 2 \times 2 \times 2 \times 2$

$$\begin{array}{r|l} 4_132 & 3 \\ 14_24 & 3 \\ 48 & 2 \\ 24 & 3 \\ 8 & 2 \\ 4 & 2 \\ 2 & 2 \\ 1 & \end{array}$$

$432 = 3 \times 3 \times 2 \times 3 \times 2 \times 2 \times 2$

$$\begin{array}{r|l} 2160 & 3 \\ 7_220 & 5 \\ 144 & 2 \\ 7_12 & 2 \\ 3_16 & 2 \\ 18 & 3 \\ 6 & 2 \\ 3 & 3 \\ 1 & \end{array}$$

$2160 = 3 \times 5 \times 2 \times 2 \times 2 \times 3 \times 2 \times 3$

2	1	0	0
4	2	0	
8	2	4	
2	8		
1	4		
7			
1			

$2100 = 5 \times 5 \times 3 \times 2 \times 2 \times 7$

6	4	8
2	1	6
7	2	
2	4	
8		
4		
2		
1		

$648 = 3 \times 3 \times 3 \times 3 \times 2 \times 2 \times 2$

3	2	4	0
6	4	8	
2	1	6	
7	2		
3	6		
1	2		
4			
2			
1			

$3240 = 5 \times 3 \times 3 \times 2 \times 3 \times 3 \times 2 \times 2$

1	3	5	0
2	7	0	
5	4		
2	7		
9			
3			
1			

$1350 = 5 \times 5 \times 2 \times 3 \times 3 \times 3$

6	1	2	5
1	2	5	
2	5		
5			
1			

$625 = 5 \times 5 \times 5 \times 5$

Niveau 3 :

2	2
1	1
1	

$22 = 2 \times 11$

3	3
1	1
1	

$33 = 3 \times 11$

5	5
1	1
1	

$55 = 5 \times 11$

3	9	6
2	1	3
3	6	6
2	2	2
11	1	1
1		

$396 = 3 \times 2 \times 3 \times 2 \times 11$

5	7	5	0
5	5	0	
5	1	1	0
2	2		
11	1		
1			

$2750 = 5 \times 5 \times 5 \times 2 \times 11$

8	1	0
4	0	5
8	2	1
2	7	
9	3	
3	3	
1		

$810 = 3 \times 3 \times 3 \times 3 \times 5 \times 2$

2	6
13	13
1	

$26 = 2 \times 13$

2	6	2
3	1	3
1		

$62 = 2 \times 31$

3	9	3
3	1	3
1		

$93 = 3 \times 31$

5	1	5
3	1	3
1		

$155 = 5 \times 31$

3	1	1	2	1	6
2	3	7	2		
2	1	8	6		
3	3	9	3		
31	3	1			
1					

$1116 = 3 \times 2 \times 2 \times 3 \times 31$

5	9	4	2	5
5	8	3	5	
3	1	1	7	
3	3	9		
13	1	3		
1				

$2925 = 5 \times 5 \times 3 \times 3 \times 13$

5	6	5
13	1	3
1		

$65 = 5 \times 13$

2	4	2
3	2	1
7	7	
1		

$42 = 2 \times 3 \times 7$

2	5	2
3	1	2
3	4	2
2	1	4
7	7	
1		

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

5	2	5	2	0
3	5	2	0	4
3	1	6	8	
2	5	6		
2	2	8		
2	1	4		
7	7			
1				

$2520 = 5 \times 3 \times 3 \times 2 \times 2 \times 2 \times 7$

3	4	1	6	8
3	1	5	6	
2	2	5	2	
2	2	6		
13	1	3		
1				

$468 = 3 \times 3 \times 2 \times 2 \times 13$

5	3	1	0
2	6	2	
31	3	1	
1			

$310 = 5 \times 2 \times 31$

$$\begin{array}{r|l} 5_2 1 & 3 \\ 17 & 17 \\ 1 & \end{array}$$

$$51 = 3 \times 17$$

$$\begin{array}{r|l} 1836 & 3 \\ 61_2 & 3 \\ 204 & 2 \\ 102 & 2 \\ 5_2 1 & 3 \\ 17 & 17 \\ 1 & \end{array}$$

$$1836 = 3 \times 3 \times 2 \times 2 \times 3 \times 17$$

$$\begin{array}{r|l} 42_2 5 & 5 \\ 8_3 5 & 5 \\ 17 & 17 \\ 1 & \end{array}$$

$$425 = 5 \times 5 \times 17$$

$$\begin{array}{r|l} 7_2 6_1 5 & 5 \\ 153 & 3 \\ 5_2 1 & 3 \\ 17 & 17 \\ 1 & \end{array}$$

$$765 = 5 \times 3 \times 3 \times 17$$

$$\begin{array}{r|l} 33_3 7_2 5 & 5 \\ 6_1 7_2 5 & 5 \\ 13_3 5 & 5 \\ 27 & 3 \\ 9 & 3 \\ 3 & 3 \\ 1 & \end{array}$$

$$\begin{array}{r|l} 4050 & 5 \\ 8_3 1_1 0 & 5 \\ 162 & 2 \\ 8_2 1 & 3 \\ 27 & 3 \\ 9 & 3 \\ 3 & 3 \\ 1 & \end{array}$$

$$3375 = 3 \times 3 \times 3 \times 5 \times 5 \times 5$$

$$4050 = 3 \times 3 \times 3 \times 3 \times 2 \times 5 \times 5$$

Niveau 4 :

$$\begin{array}{r|l} 98_2 2_1 8 & 3 \\ 3276 & 3 \\ 10_1 9_1 2 & 3 \\ 3_1 64 & 2 \\ 182 & 2 \\ 91 & 7 \\ 13 & 13 \\ 1 & \end{array}$$

$$9828 = 3 \times 3 \times 3 \times 2 \times 2 \times 7 \times 13$$

$$\begin{array}{r|l} 9_4 1_8 3_0 & 5 \\ 1836 & 3 \\ 612 & 3 \\ 20_2 4 & 3 \\ 68 & 2 \\ 3_1 4 & 2 \\ 17 & 17 \\ 1 & \end{array}$$

$$\begin{array}{r|l} 154_4 4_4 4_0 & 5 \\ 308_2 8_1 8 & 3 \\ 10296 & 3 \\ 34_1 3_1 2 & 3 \\ 11_1 4_4 & 2 \\ 5_1 7_1 2 & 2 \\ 286 & 2 \\ 143 & 11 \\ 13 & 13 \\ 1 & \end{array}$$

$$\begin{array}{r|l} 19_4 8_3 0_0 & 5 \\ 39_4 6_1 0 & 5 \\ 7_1 9_1 2 & 3 \\ 26_2 4 & 3 \\ 88 & 2 \\ 44 & 2 \\ 22 & 2 \\ 11 & 11 \\ 1 & \end{array}$$

$$9180 = 5 \times 3 \times 3 \times 3 \times 2 \times 2 \times 17$$

$$154440 = 5 \times 3 \times 3 \times 3 \times 2 \times 2 \times 11 \times 13$$

$$19800 = 5 \times 5 \times 3 \times 3 \times 2 \times 2 \times 2 \times 11$$

$$\begin{array}{r|l} 8_3 3_3 1_6 1_0 0 & 5 \\ 16_1 6_1 3_3 2_0 & 5 \\ 3_1 3_1 2_6 4 & 2 \\ 16_6 3_1 2 & 2 \\ 8_3 1_1 6 & 2 \\ 4_1 1_5 1_8 & 2 \\ 20_2 7_9 & 3 \\ 693 & 3 \\ 23_2 1 & 3 \\ 77 & 7 \\ 11 & 11 \\ 1 & \end{array}$$

$$831600 = 5 \times 5 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 7 \times 11$$

$$\begin{array}{r|l} 19_4 3_3 0_5 0 & 5 \\ 38_3 6_1 1_1 0 & 5 \\ 7_1 7_1 2_2 & 2 \\ 38_2 6_2 1 & 3 \\ 128_2 7 & 3 \\ 4_1 2_9 & 3 \\ 14_3 3 & 11 \\ 13 & 13 \\ 1 & \end{array}$$

$$193050 = 5 \times 5 \times 2 \times 3 \times 3 \times 3 \times 11 \times 13$$

$$\begin{array}{r|l} 48_3 2_2 6_1 2_2 5 & 5 \\ 9_4 6_1 5_2 5 & 5 \\ 19_4 3_3 0_5 & 5 \\ 38_2 6_2 1 & 3 \\ 128_2 7 & 3 \\ 4_1 2_9 & 3 \\ 14_3 3 & 11 \\ 13 & 13 \\ 1 & \end{array}$$

$$482625 = 5 \times 5 \times 5 \times 3 \times 3 \times 3 \times 11 \times 13$$

8 ₃ 7 ₂ 7 ₂ 5 0 0	5	5 ₂ 9 ₂ 0 ₂ 4 9	3	4 6 ₁ 8 ₃ 7 ₂ 5	5	9 ₄ 5 0 4 0	5
1 7 ₂ 5 5 0 0	5	1 9 ₁ 6 ₁ 8 3	3	9 4 ₃ 3 ₇ 2 ₅	5	1 9 ₁ 0 0 8	2
3 5 1 0 0	5	6 5 ₂ 6 ₂ 1	3	1 8 ₃ 7 ₂ 5	5	9 ₁ 5 ₁ 0 4	2
7 ₂ 0 2 0	5	2 1 8 ₂ 7	3	3 7 ₂ 5	5	4 7 ₁ 5 ₁ 2	2
1 4 0 4	2	7 ₁ 2 9	3	7 ₂ 5	5	2 3 ₁ 7 ₁ 6	2
7 ₁ 0 2	2	2 4 3	3	1 5	5	1 1 ₁ 8 8	2
3 5 ₂ 1	3	8 ₂ 1	3	3	3	5 ₁ 9 ₁ 4	2
1 1 ₂ 7	3	2 7	3	1		2 9 ₂ 7	3
3 9	3	9	3			9 9	3
1 3	13	3	3	46875 = 5x5x5x5x5x5x3		3 3	3
1		1				1 1	11
						1	

877500 = 5x5x5x5x2x2x3x3x3x13

59049 = 3x3x3x3x3x3x3x3x3x3

95040 = 5x2x2x2x2x2x2x3x3x3x11

1 6 ₁ 6 ₁ 3 ₂ 3 ₂ 2 ₀ 0 0	5	2 3 ₃ 2 ₂ 3 ₃ 6 ₁ 8 ₃ 7 ₂ 5	5	1 2 ₂ 3 ₃ 5 5 2 0 0 0	5
3 3 ₃ 2 ₂ 6 ₁ 4 ₀ 0 0	5	4 6 ₁ 4 ₄ 7 ₂ 3 ₃ 7 ₂ 5	5	2 4 7 1 0 4 0 0	5
6 6 ₁ 5 2 2 ₈ 3 ₀	5	9 4 ₂ 2 ₉ 4 ₄ 4 ₇ 2 ₅	5	4 9 ₄ 4 ₄ 2 ₀ 8 ₃ 0	5
1 3 ₁ 3 ₁ 0 5 ₁ 6	2	1 8 ₃ 5 8 ₃ 9 ₄ 5	5	9 1 ₈ 8 4 1 6	2
6 6 5 1 ₂ 8	2	3 7 ₁ 1 ₂ 7 9	3	4 9 1 ₄ 2 0 8	2
3 3 ₁ 2 6 4	2	1 2 3 9 3	3	2 4 7 ₁ 1 ₁ 0 4	2
1 6 6 3 ₁ 2	2	4 1 ₁ 2 ₃ 2 ₁	3	1 2 3 ₁ 5 ₁ 5 ₁ 2	2
8 3 1 6	2	1 3 ₁ 7 ₂ 7	3	6 1 ₁ 7 ₁ 7 ₁ 6	2
4 1 5 8	2	4 ₁ 5 9	3	3 ₁ 0 8 8 8	2
2 0 7 9	3	1 5 3	3	15 ₁ 4 4 4	2
6 9 3	3	5 ₂ 1	3	7 7 2 2	2
2 3 ₂ 1	3	1 7	17	3 8 ₂ 6 ₂ 1	3
7 7	7	1		1 2 8 ₂ 7	3
1 1	11			4 ₁ 2 9	3
1				1 4 ₃	11
				1 3	13
				1	

16632000 = 5x5x5x2x2x2x2x2x3x3x3x7x11

23 236 875 = 5x5x5x5x3x3x3x3x3x3x3x17

123 552 000 = 11x13x3x3x3x2x2x2x2x2x2x2x5x5x5