# ChingQuizz : 5 exercises available for Quizz assessment :

## 1. *Integers, divisors, multiples*

**E.8244** Complete the table with crosses to indicate whether the integers shown are divisible by 2, 3, 5, 9.

| Entiers | 123 | 504 | 205 | 1433 | 2430 |
|---|---|---|---|---|---|
| Divisible by 2 | | | | | |
| Divisible by 3 | | | | | |
| Divisible by 5 | | | | | |
| Divisible by 9 | | | | | |

**E.8245**

(1) Give the expression of the fractions below in irreducible form:

(a) $\frac{14}{26}$ (b) $\frac{66}{27}$ (c) $\frac{15}{55}$ (d) $\frac{56}{40}$

(2) Perform the operations below, simplifying each of the calculation terms beforehand:

(a) $\frac{15}{25}+\frac{9}{15}$ (b) $\frac{42}{14}-\frac{36}{12}$

**E.8243**

> L the integer 10 has 4 factors which are:
> 1 ; 2 ; 5 ; 10

Complete the table below:

| Entier $x$ | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nombre de diviseurs de $x$ | | | | | | | | | 4 | | |

**E.8250** Which of the numbers below admits exactly 5 factors:

10 25 35 81 125

**E.8251** Which of the numbers below admits exactly 4 factors:

24 28 49 64 343

**E.10545** I am a number divisible by 5 and by 7, I am smaller than 100 and I have 8 factors. Who am I?

**E.8252** I am a number divisible by 6 and by 21, I am smaller than 100 and I have 8 factors. Who am I?

**E.8246** *In this exercise, any trace of research, however incomplete, or initative, however unsuccessful, will be taken into account in the assessment.*

"*The hidden number:*
- *I am an integer between 100 and 400.*
- *I am even.*
- *I am divisible by 11.*
- *I also have 3 and 5 as factors.*

*Qui suis-je?*".

Explain a procedure for finding the hidden number, and give its value.

**E.11744**

(1) Compléter les pointillés:

| | |
|---|---|
| $13 = \ldots \times 3 + 1$ | $17 = \ldots \times 3 + 2$ |
| $14 = 4 \times 3 + \ldots$ | $18 = 6 \times 3 + \ldots$ |
| $15 = \ldots \times 3$ | $19 = \ldots \times 3 + 1$ |
| $16 = 5 \times 3 + \ldots$ | $20 = 6 \times 3 + \ldots$ |

(2) Que peut-on dire de l'écriture des nombres multiples de 3?

## 2. *Odd and even integers*

**E.1771**

(1) (a) Perform the Euclidean divisions below *(and not the decimal divisions)* and complete the relationship shown under each:

15 | 2    28 | 2    131 | 2    206 | 2

(b) Complete the following relationships related to question (a):

- $15 = \ldots \times 2 + \ldots$
- $28 = \ldots \times 2 + \ldots$
- $131 = \ldots \times 2 + \ldots$
- $206 = \ldots \times 2 + \ldots$

(2) What can be said about the remainder of the Euclidean division by 2 of an even number? the remainder of the Euclidean division by 2 of an odd number?

E.8261 Complete the following two double-entry tables:

| + | Pair | Impair |
|---|---|---|
| Pair | | |
| Impair | | |

| $\times$ | Pair | Impair |
|---|---|---|
| Pair | | |
| Impair | | |

E.8259 Complete the following sentences without justification using the words **even**, **odd**, **any**.

(a) The sum of two even integers is an integer ......

(b) The sum of two odd integers is an integer ......

(c) The product of two odd integers is an integer ......

(d) The product of an even integer by an odd integer is an integer ......

E.8267 Without justification, say whether the following assertions are true, false or undecidable:

1. The sum of two odd integers is an even integer.
2. The product of an even integer and an odd integer is even.
3. The product of two consecutive integers is an even integer.
4. The sum of five consecutive integers is a multiple of 5.

E.8361

**Reminder:** parity of operations:

| + | Even | Odd |
|---|---|---|
| Even | Even | Odd |
| Odd | Odd | Even |

| $\times$ | Even | Odd |
|---|---|---|
| Even | Even | Even |
| Odd | Even | Odd |

Let $a$ be an integer such that the integer $a^2+9$ is an even number.

What can be said about the parity of the integer $a$? Justify your answer.

## 3. *Parity and algebraic manipulations*

E.8256

1. (a) Let $k$ and $k'$ be two relative integers $(k, k' \in \mathbb{Z})$, expand and reduce the expression: $(2{\cdot}k+1)(2{\cdot}k'+1)$

   (b) Deduce the parity of the product of two odd integers.
2. Deduce the parity of the square of an odd number.

E.3027 Show that the sum of four consecutive integers is an even integer.

E.9468 Show that, for any odd integer $n$, the expression:

$3{\cdot}n^2+2{\cdot}n+1$

defines an even integer.

E.9469 Show that, for any integer $n$, the expression:

$n^2+3{\cdot}n$

is an even integer.

E.233 In this exercise, we will use the fact that any even natural number *(resp. odd)* is written as $2\times n$ *(resp.* $2\times n+1$*)* where $n$ is a natural number.

Prove the following assertions:

1. The sum of two odd integers is an even integer.
2. The product of an even integer and an odd integer is even.
3. The product of two consecutive integers is an even integer.
4. The sum of five consecutive integers is a multiple of 5.

E.11259 Consider the integer $A$ defined by:

$A = (n+1)^2 - (n-1)^2$ where $n \in \mathbb{N}$.

Show that, for any integer $n$, the integer $A$ is a multiple of 4.

E.11291

1. Copy and complete the dotted lines so that the expression on the left is equal to the expression on the right:

   $(2{\cdot}k+1)^2 = 2(\dots\dots\dots)+1$
2. The identity in the previous question allows us to state:

   "*The square of ......... is an integer .........*"

   Copy and complete the sentence above.

E.11445 Let $a$ and $b$ be two odd integers. Show that the integer $a^2+b^2+6$ is a multiple of 8.

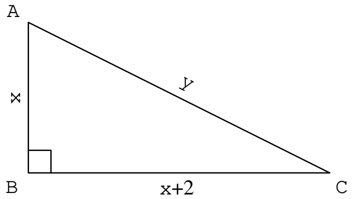
E.11257 Show that the integer preceding the square of any odd integer is a multiple of 4.

**Hint:** The goal of this exercise is to generalize the following observation:

$3^2-1=8=2\times\mathbf{4}$ ; $5^2-1=24=6\times\mathbf{4}$ ; $7^2-1=48=12\times\mathbf{4}$
$9^2-1=80=20\times\mathbf{4}$ ; $11^2-1=30\times\mathbf{4}$ ; $13^2-1=42\times\mathbf{4}$

E.9479 Consider the triangle $ABC$ right-angled $B$, shown below, such that $BC=AB+2$ and its measures are integers:




We model the situation by noting $AB=x$ and $AC=y$.

1. a. Express $y^2$ in terms of $x$ as an expanded and simplified expression.
   b. Deduce that the integer $y$ is even.
2. a. Justify that $2{\cdot}x^2+4{\cdot}x+4$ is a multiple of 4.
   b. Deduce that the integer $x$ is even.
3. Complete the algorithm below giving us the values of $x$ and $y$ *(with $y<1000$)* realizing the dimensions of this triangle:

```
import math
for x in range(...):
    y=math.sqrt(...)
    if math.floor(...)==...:
      print(x,y)
```

E.8260

1. Let $M$ be a natural number, odd and not prime. Suppose that $M=a^2-b^2$ where $a$ and $b$ are two natural numbers.

   Show that $a$ and $b$ do not have the same parity.
2. Let $N$ be an integer that can be factored:
   $N=p{\times}q$
   We assume that this factorization is related to two integers $a$ and $b$ allowing the identity:
   $p=(a+b)\quad;\quad q=(a-b)$
   a. Express the integers $a$ and $b$ in terms of $p$ and $q$.
   b. Justify that the integers $p$ and $q$ have the same parity.
   c. Deduce the representation of the integer $N$ as a difference of squares, in terms of $p$ and $q$.
3. Write the integer 63 in three different forms as a subtraction of squares.

E.9470 Show that for any integer $k$, the integer $k^2+k$ is even.

## 4. *Prime numbers*

E.1721 The Eratosthenes sieve *(III$^{ième}$ century BC)* makes it easy to find prime integers from a list.

1. a. Justify that 2 is a prime integer.
   b. In the table below, hatch all the boxes whose integer is a multiple of 2 *(do not hatch the box "2")*.
2. a. Justify that 3 is a prime integer.
   b. In the table below, hatch all boxes whose integer is a multiple of 3 *(do not hatch the box "3")*.
3. a. The white square following the square for 3 is the square for 5: justify, using this observation, that 5 is a prime integer.
   b. Hatch all squares that are multiples of 5, except the square "5".
4. a. In the table below, what is the white box succeeding "5"?
   Also justify, using the observation of the table, that 7 is a prime integer.
   b. Hash all the multiples of the integer 7 in the table *(except the box "7")*.
5. Continue work to hatch in the table all non-premier integers present among the integers from 1 to 100.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

E.8253

**Definition :**

- The set of positive or zero integers is called the **set of natural integers** and is denoted $\mathbb{N}$.
  Thus : $\mathbb{N}=\{0\,;1\,;2\,;3\,;4\,;\dots\}$
- A natural integer $n$ $(n\in\mathbb{N})$ is said to be a **integer premier** if it admits only two factors 1 and itself.
  - The integer 7 is a prime integer because it admits as factor : 1 and 7.
  - The integer 9 is not a prime integer because it admits 3 factors : 1, 3 and 9.

1. Justify that the numbers 32 and 63 are not prime integers.
2. Justify that the number 17 is a prime integer.

E.1722

A natural number is said to be prime if it admits as divisors only 1 and itself : 3 is a prime number, because its only divisors are 1 and 3.

1. Which of the following integers are prime?
   2 ; 4 ; 7 ; 12
2. Give all prime integers from 1 to 25.

E.8248

1. Name the ten prime integers less than or equal to 30.
2. Which of the numbers below are prime numbers.

| | | | | | | |
|---|---|---|---|---|---|---|
| 33 | 47 | 51 | 28 | 39 | 49 | 85 |

E.8255

Justify that each of the sentences below is a false assertion :

1. The sum of two prime integers is a prime integer.
2. The difference of two prime integers is a prime integer.
3. The product of two prime integers is a prime integer.

## 5. *Decomposition into product of prime factors*

E.240

We're going to study the algorithm for decomposing integers into products of prime factors.

1. Name the eight prime integers less than 20.

The table opposite shows the algorithm for decomposing 30 into a product of prime factors :

| | | |
|---|---|---|
| 30 | 2 | $30\div2=15$ |
| 15 | 3 | $15\div3=5$ |
| 5 | 5 | $5\div5=1$ |
| 1 | | |

- The left-hand column represents the integer 30 and the successive quotients obtained.
- The column on the right represents the divisors used ; note that only prime integers are used.

The algorithm stops when 1 is obtained in the left-hand column.

2. a. Justify, in view of the above table, the following equality :

$$\frac{\frac{\frac{30}{2}}{3}}{5}=1$$

b. Let $x$ be a real number and $a$, $b$ and $c$ be three non-zero real numbers, establish the following equality :

$$\frac{\frac{\frac{x}{a}}{b}}{c}=\frac{x}{a\times b\times c}$$

c. Deduce from the previous questions, that the prime factor decomposition of 30 is :
$30=2\times3\times5$

E.7122

1. Use the previous algorithm to determine the prime factor decomposition of the following integers :
   a. 84  b. 144  c. 140  d. 196
2. Deduce the product of prime factors decomposition of the following products :
   a. $84\times144$  b. $140\times196$

E.255

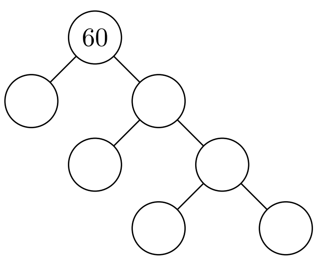
Give the product of prime factors decomposition of the three integers below :

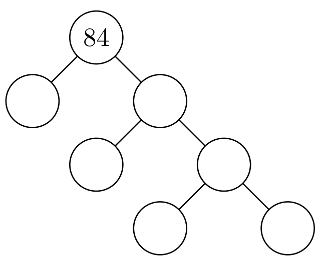
a. $16\times25$  b. $34\times12$  c. $72\times18\times10$  d. $32\times121$

## 6. *Product of prime factors, divisors and multiples*

E.11288

1. Give the prime factorization of the integers 60 and 84.




2. Deduce the prime factorization of 5040.

**Hint**, Note that : $60\times84=5040$

E.9578 Here is the prime factor decomposition of the integer 360 : $360=2^3\times3^2\times5$

1. Justify that the following integers are factors of 360 :

   a. $2^1\times3^2$ b. $2\times5$ c. $2^2\times3^0\times5$

2. Which of the following integers are factors of 360 :

   A. $2^0\times3^0\times5^0$ b. $2^4\times3$

   c. $2\times5^2$ d. $2^3\times3^2\times5$

3. What conditions, on the exponents, can be given to the integer $2^n\times3^n\times5^p$ for it to be a factor of 360?

## 7. *Product of prime factors and reduction of fractions*

E.8424

1. Give the prime factor product decomposition of the numbers 60 and 450.
2. Deduce the simplified expression for the quotient $\dfrac{60}{450}$
3. Perform the sum : $\dfrac{1}{60}+\dfrac{1}{450}$

E.234

1. Give the decomposition of the integers 108 and 30 into products of prime factors.
2. Highlight your approach to the following two questions :
   a. Simplify the fraction $\dfrac{30}{108}$.
   b. Perform the subtraction below and give the result as an irreducible fraction : $\dfrac{5}{108}-\dfrac{7}{30}$

E.1805

1. Give the decomposition into products of prime factors of the integers 20 and 135.
2. Answer the questions below, justifying the approach or indicating the steps in the calculations :
   a. Simplify the fraction $\dfrac{20}{135}$.
   b. Perform the following subtraction : $\dfrac{7}{20}-\dfrac{8}{135}$

E.9529

1. Give the prime factor product decomposition of the integer 36.
2. The following prime product decomposition is given : $56=2^3\times7$
   a. Give the greatest common factor to 36 and 56.
   b. Deduce the expression reduce from the expression $\dfrac{36}{56}$
3. The following decomposition into products of prime factors is given : $42=2\times3\times7$
   a. Give the values of the natural numbers $a$, $b$, $c$ such that the integer $n=2^a\times3^b\times7^c$ is the smallest multiple of 36 and 42.
   b. Deduct the sum of : $\dfrac{1}{36}+\dfrac{1}{42}$

E.3361

1. Give the product of prime factors decomposition of the following integers :

   a. 2 016 b. 2 100 c. 864

2. Perform the following operations and give the result in simplified form :

   a. $\dfrac{2\,016}{2\,100}$ b. $\dfrac{1}{2\,100}+\dfrac{1}{864}$

## 8. *Powers*

E.7123

1. Give the prime factor product decomposition of the integers : 16 ; 24
2. a. Determine the prime factor decomposition of the product : $16\times24$.
   b. Determine the product decomposition of prime factors of the product : $16^3\times24^2$.
3. Determine the prime factor product decomposition of the quotient : $\dfrac{24^5}{16^2}$.

E.9466 Simplify the following integers as products of prime factors :

a. $18\times15^2\times9\times82$ b. $9^2\times15^{-2}\times4^4$

E.3362 Simplify the following integers as products of prime factors :

a. $\dfrac{5\times3^4\times12^2}{21^2\times15^3}$

E.26

1. Indicate whether the following numbers are cubes of natural numbers :

   a. 9 b. 27

   c. $3^3\times7^3$ d. $11^9\times19^6\times67^3$ e. $2^2\times5^3\times11$

2. a. Find the number $b$ such that $180\times b$ is the cube of a natural number
   b. Is this number $b$ unique?

**E.235** Using the product decomposition of prime factors, write the numbers below in the form:
$2^m \times 3^n \times \cdots$ where exponents are integers **relative**.

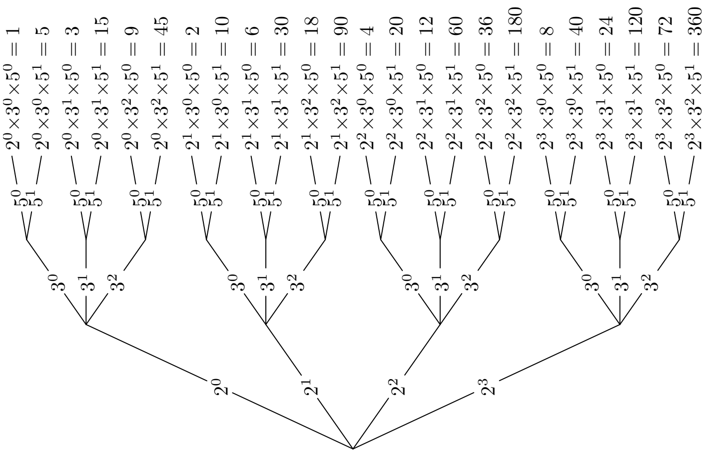
(a) $\dfrac{9}{24}$ (b) $\dfrac{28^2}{32}$ (c) $\dfrac{81\times6^4}{27^2\times7^5}$ (d) $\dfrac{38^2\times11}{6^5\times4^4\times19}$

**E.9467** Simplify the following quotients as products of prime factors:

(a) $\dfrac{5^2\times3^2}{5^5\cdot(3^4+3^4)}$ (b) $\dfrac{2^2\times5^{-4}}{2^{21}+2^{22}}$

## 9. *Integers and numbers of divisors*

**E.260** The decision tree below gives all the 24 divisors of the integer 360.




Using this example, determine the set of divisors of the following integers:

(a) 12 (b) 135

**E.9530** Consider the integer: $a=156$

1. Give the product decomposition of prime factors of the number $a$.
2. (a) Justify that $2^2\times17$ cannot be a factor of $a$
   (b) Justify that the integer $2^2\times3^2$ is not a factor of $a$.
3. Give the set of factors of the integer $a$.

**Reminder:** the prime integers less than 20 are:
2 ; 3 ; 5 ; 7 ; 11 ; 13 ; 17 ; 19

**E.276**

1. Determine the decomposition of 245 into a product of prime factors.
2. Use a choice tree, to determine the set of divisors of 245.

**E.9536**

1. Give the prime factor product decomposition of the integer 306.
2. Give the set of factors of the integer 306.

## 10. *In depth: parity and reasoning by absurdity*

**E.8257**

1. Prove that the following statement is true:
   "*There are no odd integers that have an even divisor*"?

**Hint:** To prove this statement, assume that there is an integer $n$ that has an even divisor $k$. It then suffices to show that this assumption leads to a contradiction: this assumption cannot therefore be true.

2. What do you think of the statement:
   "*An even integer does not have an odd divisor*"?

## 11. *Deepening: parity and reasoning by disjunction of cases*

**E.8360** Prove that the sum of two integers with the same parity is an even integer.

**Hint:** for this, we'll study separately:
- the sum of two even integers
- and the sum of two odd integers.

**E.9532** Show that the difference between the squares of two consecutive integers is always an odd integer.

**E.1847** We want to show that the expression $A=n^2+n+2$ defines an even number for every natural number $n$ ($n\in\mathbb{N}$).

To do this, we break the argument down into two questions:

1. When $n$ is an even integer, show that the expression $A$ defines an even integer.
2. When $n$ is an odd integer, show that the expression $A$ defines an even integer.

**E.8263** Consider a relative integer $a$ $(a\in\mathbb{Z})$, such that the integer $a^2+9$ is an even integer. Give the parity of the integer $a$.

**E.65** Show that $3n^2+3n+6$ is a multiple of 6 for all $n\in\mathbb{N}$

**E.8262** Show that, in the integer set of relative integers, the predecessor of the square of any odd integer is a multiple of 8.

*Hint: initially, we'll show that this integer is a multiple of* 4*, then by a disjunction of cases, we'll show that it is necessarily a multiple of* 8.

**E.8258**

1. For any relative integer $n$ $(n\in\mathbb{Z})$, consider the expression: $p=2{\cdot}n^2+3{\cdot}n+3$
   a. If $n$ is even, show that the expression $p$ defines an odd integer.

   *Hint:* an even integer $n$ is written $2{\cdot}k$ where $k\in\mathbb{Z}$

   b. Show that, if $n$ is odd, the expression $p$ defines an even integer.
2. Justify that the expression $n^2+n+3$ defines an odd integer for any relative integer $n$.

## 12. *In depth: primality criterion*

**E.8247**

> The following two propositions are accepted:
>
> **Proposition *(admitted)*:**
>
> *Let $n$ be a natural number $(n\in\mathbb{N})$. If $n$ is not a prime integer then there exists at least one prime integer $p$ factor of $n$ such that $p$ is between 2 and $\sqrt{n}$.*
>
> **Contradictory proposition:**
>
> *Let $n$ be a natural number $(n\in\mathbb{N})$. If the integer $n$ admits no prime factor $p$ between 2 and $\sqrt{n}$, then the integer $n$ is prime.*

1. Let's use the **proposition**:
   a. Name all prime integers between 2 and $\sqrt{143}$.
   b. Justify that the number 143 is not a prime integer.
2. Using the **contraposed proposition**:
   a. Name all prime integers between 2 and $\sqrt{157}$.
   b. Justify that the number 157 is a prime integer.
3. In the list of numbers below, cross out the numbers that are not prime integers:

| | | | | | |
|---|---|---|---|---|---|
| 93 | 119 | 253 | 383 | 399 | 631 |

> To see the demonstration of the "*proposition admitted*", suivez le lien ci-contre
>
> r749-0

**E.1783** Determine whether the following integers are prime or not. Explain your reasoning.

a. 251 b. 623

**E.8254** Among the integers strictly less than 1 000, give the largest prime integer.

**E.1727** The aim of this exercise is to establish the following proposition:

***Proposition:***

*Any natural integer $n$ non-premier admits a prime divisor lying in the interval $\left[2\,;\sqrt{n}\right]$.*

To do this, let's take a non-first natural number $x$; then there are two natural numbers $a$ and $b$ greater than or equal to 2 such that:

$x=a\times b$

Let's assume that $a$ is smaller than $b$ *(this is possible by reversing the role of "a" and "b" if necessary)*

To show that $a$ belongs to the interval $\left[2\,;\sqrt{x}\right]$ we'll reason by the absurd.

To do this, let's assume that the integer belongs to the interval $\left]\sqrt{x}\,;+\infty\right[$

1. Justify the following inequality: $a\times b>x$
2. Infer that: $a\in\left[2\,;\sqrt{x}\right]$.

The demonstration ends from the fact that $a$ is a divisor of $x$ belonging to the interval $\left[2\,;\sqrt{x}\right]$:

- either $a$ is prime;
- or $a$ is not prime and $a$ then admits prime divisors; these divisors will also be prime divisors of $x$ belonging to the interval under consideration.

## 13. *Greatest common divisor: decomposition into product of prime factors*

**E.10653**

> **Method:** let $a$ and $b$ be two integers whose decomposition into products of prime factors is known.
> The prime factor decomposition of *PGCD(a,b)* verifies:
>
> - its factors are the factors common to each of the decompositions of $a$ and $b$.
> - the exponent of each of its factors is the smallest exponent of that factor encountered in the decompositions of $a$ and $b$.

**Example :** for $a=36$ and $b=60$, we have :
$a=2^2\times3^3$ ; $b=2^2\times3\times5$

Thus, the decomposition of $PGCD(32{,}60)$ verifies :

- its factors are 2 and 3.
- The exponent of the 2 factor is 2 ; the exponent of the 3 factor is 1.

On en déduit la valeur de :
$PGCD(36.60)=2^2\times3^1=4\times3=12$

1. a. Determine the prime factor product decomposition of 126.
   b. Determine the prime factor product decomposition of 108.
2. Deduct the value $PGCD(126.108)$.

E.10693

1. Determine the prime factor product decomposition of the integers 168 and 192.
2. Deduce the PGCD of the integers 168 and 192.

E.10694

1. Determine the prime factor product decomposition of the integers 162 and 378.
2. Deduce the PGCD of the integers 162 and 378.

E.10700

1. Determine the prime factor product decomposition of the integers 171 and 228.
2. Deduce the PGCD of the integers 171 and 228.

E.10576

1. Determine the prime factorizations of the integers 756 and 792.
2. Deduce the GCD of the integers 756 and 792.

## 14. *Least common multiple with decomposition*

E.10662

**Method :** let $a$ and $b$ be two integers whose decomposition into products of prime factors is known.

The decomposition of $PPCM(a{,}b)$ has the following characteristics :

- the set of factors contained in the decompositions of $a$ and $b$
- the exponents of each of these factors is the maximum exponent encountered in the decompositions of $a$ and $b$.

**Example :** for $12=2^2\times3$ et $15=3\times5$.

- the $PPCM(a{,}b)$ has as factor 2, 3 and 5.
- the $PPCM(a{,}b)$ recovers the largest exponents of the decomposition of 12 and 15.

On a : $PPCM(12.15)=2^2\times3^1\times5^1=4\times3\times5=60$.

1. Determine the prime factor product decomposition of 20 and 75.
2. Deduce the value of $PPCM(20.75)$.

E.10895

1. Determine the prime factor product decompositions of the integers 252 and 336.
2. Deduce the value of the PPCM of the integers 252 and 336.

E.10896

1. Determine the prime factorization of the integers 336 and 840.
2. Deduce the least common multiple of the integers 336 and 840.

E.10897

1. Determine the prime factor product decomposition of the integers 448 and 560.
2. Deduce the least common multiple to the integers 448 and 560.

## 15. *Unclassified exercises*

E.9584 Among the following integers, say whether they are prime or not. Justify your answers :

A. 903 b. 167