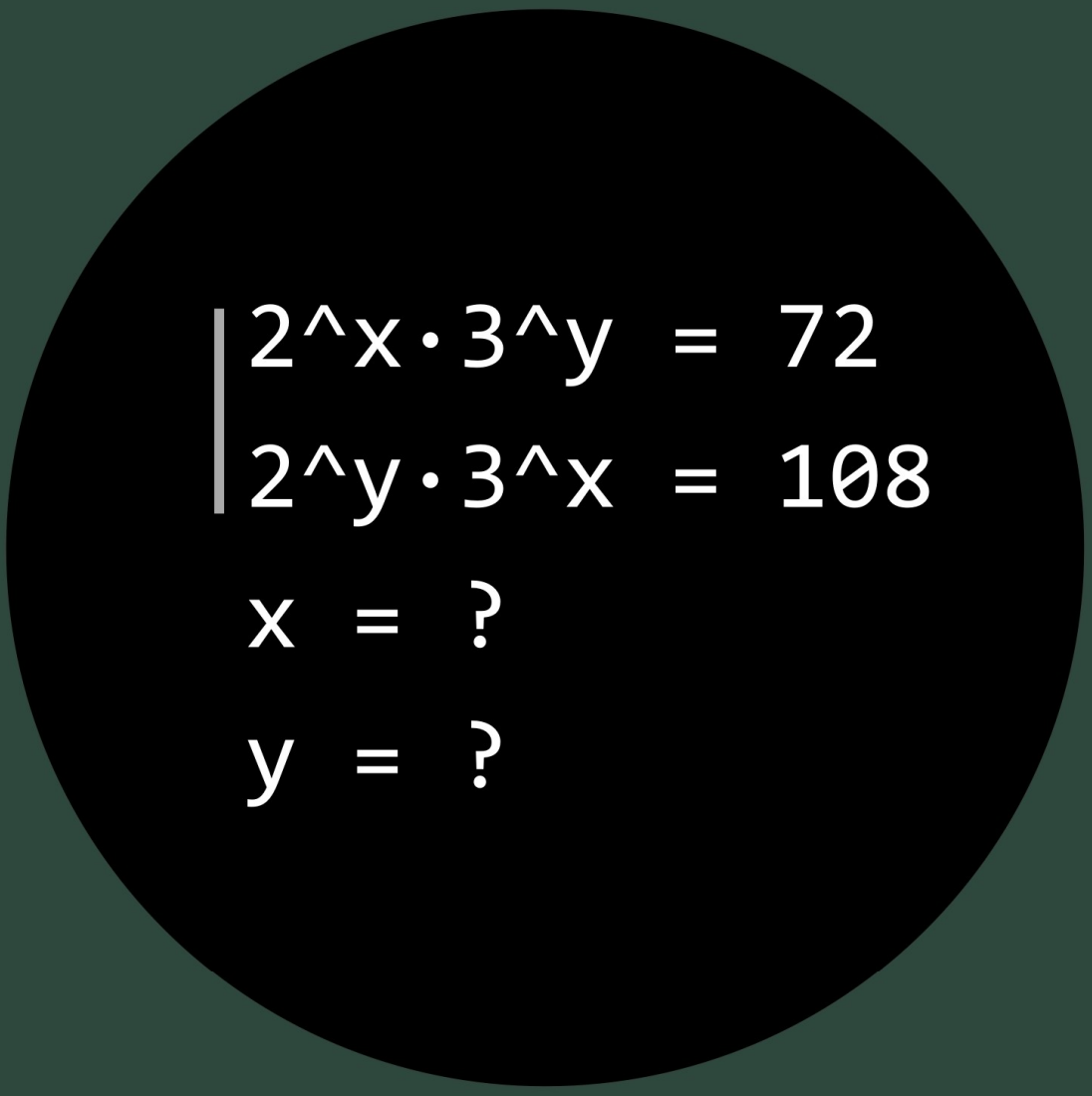
2^x·3^y = 72
2^y·3^x = 108
x = ?
y = ?

---------- Q U E S T I O N ----------

| 2^x·3^y = 72
|
| 2^y·3^x = 108

x = ?

y = ?

---------- R É P O N S E (proposée par GF) ----------

Note: L1, L2, L3 ... = numéros des lignes dans un système d'équations.

| L1: 2^x·3^y = 72
|
| L2: 2^y·3^x = 108

----- L1 -----

2^x·3^y = 72

log[2](3) = 1,58496

log[2](72) = 6,16992

2^x·2^(1,58496y) = 2^6,16992

2^(x + 1,58496y) = 2^6,16992

même base (= 2), donc:

x + 1,58496y = 6,16992   ---> L3

----- L2 -----

2^y·3^x = 108

3^x·2^y = 108

log[3](2) = 0,63092

log[3](108) = 4,26185

3^x·3^(0,63092y) = 3^4,26185

3^(x + 0,63092y) = 3^4,26185

même base (= 3), donc:

x + 0,63092y = 4,26185   ---> L4

----- L3 et L4 -----

| L3: x + 1,58496y = 6,16992
|
| L4: x + 0,63092y = 4,26185

L3 - L4: (x + 1,58496y) - (x + 0,63092y) = 6,16992 - 4,26185

x + 1,58496y - x - 0,63092y = 6,16992 - 4,26185

x - x + 1,58496y - 0,63092y = 6,16992 - 4,26185

0,95404y = 1,90807

y = 1,90807/0,95404

.------------------.
| y = 1,99999 = 2 |
·------------------·

x + 1,58496y = 6,16992

x + 1,58496·2 = 6,16992

x + 3,16992 = 6,16992

x = 6,16992 - 3,16992

.--------.
| x = 3 |
·--------·

voir pages suivantes

---------- R É P O N S E (vue sur YouTube) ----------

Note: L1, L2, L3 ... = numéros des lignes dans un système d'équations.

```
-----------------
----- L1·L2 -----
-----------------
```

| L1: 2^x·3^y = 72
|
| L2: 2^y·3^x = 108

L1·L2: 2^x·3^y·2^y·3^x = 72·108

2^x·2^y·3^y·3^x = 72·108

2^(x + y)·3^(x + y) = 72·108

    (2·3)^(x + y) = 72·108

6^(x + y) = 72·108

72·108 = 2·36·3·36

72·108 = 2·6^2·3·6^2

72·108 = 6·6^2·6^2

72·108 = 6^1·6^2·6^2

72·108 = 6^(1 + 2 + 2)

72·108 = 6^5

si 72·108 = 6^5 alors 6^(x + y) = 72·108 devient:

6^(x + y) = 6^5

même base (= 6), donc:

x + y = 5   ---> L3

```
----------------
---- L1/L2 -----
----------------
```

| L1: 2^x·3^y = 72
|
| L2: 2^y·3^x = 108

L1/L2: (2^x·3^y)/(2^y·3^x) = 72/108

(2^x·2^y)/(3^y·3^x) = 72/108

2^(x + y)/3^(x + y) = 72/108

(2/3)^(x - y) = 72/108

72/108 = (2·36)/(3·36)

72/108 = 2/3

si 72/108 = 2/3 alors (2/3)^(x - y) = 72/108 devient:

(2/3)^(x - y) = 2/3

(2/3)^(x - y) = (2/3)^1

même base (= 2/3), donc:

x - y = 1   ---> L3

```
--------------------
----- L3 - L4 -----
--------------------
```

| L3: x + y = 5
|
| L4: x - y = 1

L3 - L4: (x + y) - (x - y) = 5 - 1

x + y - x + y = 4

x - x + y + y = 4

2y = 4

y = 4/2

```
.--------.
| y = 2 |
.--------.
```

x + y = 5

x + 2 = 5

x = 5 - 2

```
.--------.
| x = 3 |
.--------.
```