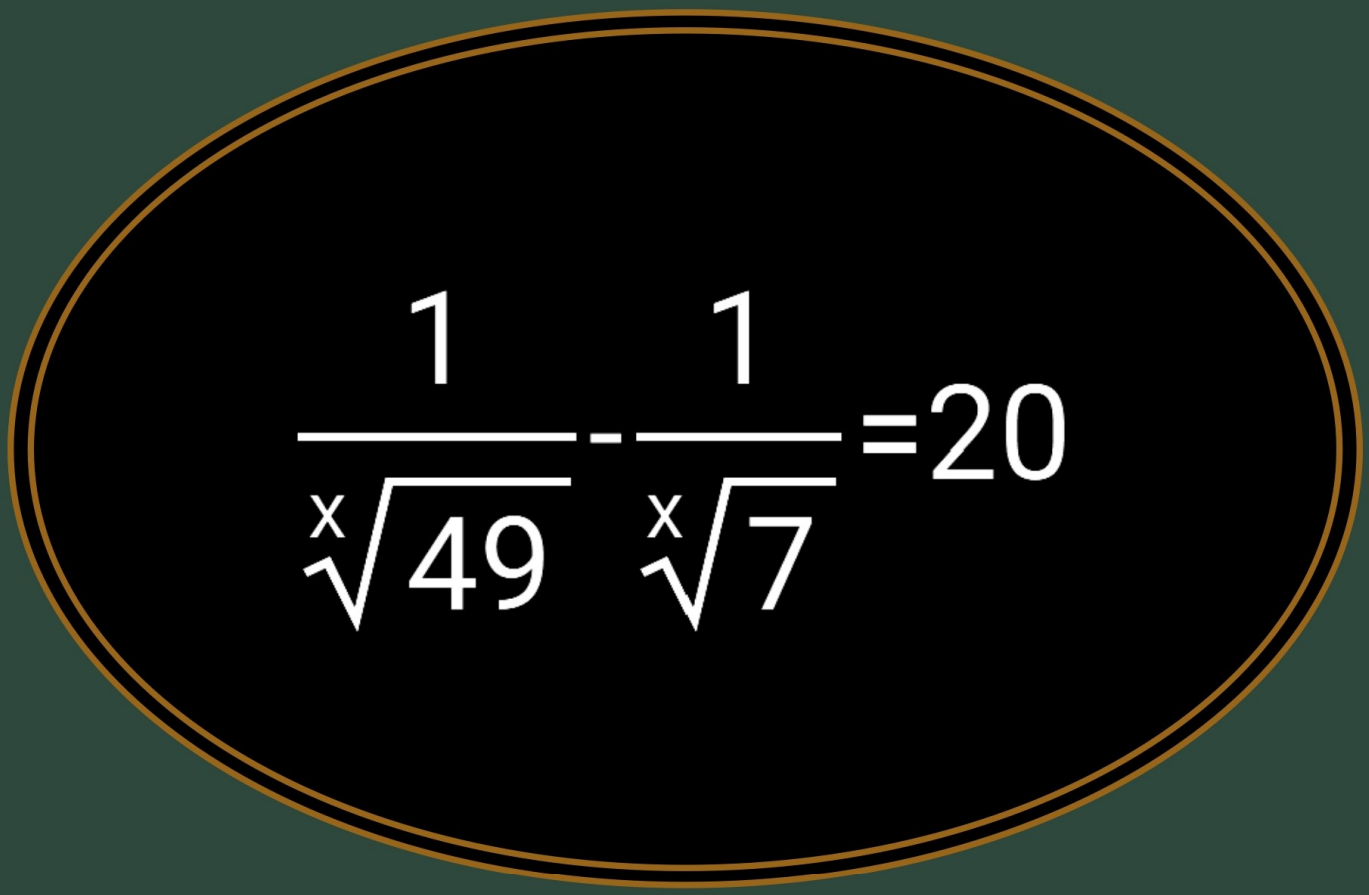
1
x√49
-
1
x√7
=20

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

$$\frac{1}{\sqrt[x]{49}} - \frac{1}{\sqrt[x]{7}} = 20$$

x = ?

---------- R É P O N S E ----------

$$\frac{1}{\sqrt[x]{49}} - \frac{1}{\sqrt[x]{7}} = 20$$

$$\frac{1}{49^{1/x}} - \frac{1}{7^{1/x}} = 20$$

$$\frac{1}{(7^{1/x})^2} - \frac{1}{7^{1/x}} = 20$$

soit $7^{1/x} = k$

$1/k^2 - 1/k = 20$

$k/k^3 - k^2/k^3 = 20$

$(k - k^2)/k^3 = 20$

$20 \cdot k^3 = k - k^2$

$20 \cdot k^3 + k^2 - k = 0$

$k \cdot (20k^2 + k - 1) = 0$

----- k = 0 -----

k = 0

$7^{1/x} = k = 0$

$7^{1/x} = 0$

$1/x = 0$

division par zéro => pas de solution pour 1/x = 0

(voir page suivante)

----- (20k² + k - 1) = 0 -----

20k² + k - 1

Δ = 1² - 4·20·(-1) = 1 + 80 = 81

√Δ = √81 = +9 et √81 = -9

• cas √Δ = +9: k = (-1 + 9)/2·20 = 8/40 = 1/5

• cas √Δ = -9: k = (-1 - 9)/2·20 = -10/40 = -1/4

----- k = 1/5 -----

k = 1/5

7^(1/x) = k = 1/5

7^(1/x) = 1/5

log(7^(1/x)) = log(1/5)

(1/x)·log(7) = log(1/5)

note: log(1/5) = log(1) - log(5) = 0 - log(5) = -log(5)

1/x = -log(5)/log(7)

x = 1/(-log(5)/log(7))

x = log(7)/-log(5)

| x = log(7)/-log(5) ≈ -1,209062 |

----- k = -1/4 -----

k = -1/4

7^(1/x) = k = -1/4

7^(1/x) = -1/4

logarithme d'un terme négatif => pas de solution pour 7^(1/x) = -1/4

(fin)