$$a + b = 6\sqrt{ab}$$

$$a/b = ?$$

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

a + b = 6√(ab)

a/b = ?

---------- R É P O N S E ----------

a + b = 6√(ab)

(a + b)² = (6√(ab))²

a² + b² + 2ab = 36ab

a² + b² + 2ab - 36ab = 0

a² + b²- 34ab = 0

(a² + b²- 34ab)/(ab) = 0/(ab)

a²/(ab) + b²/(ab) - 34ab/(ab) = 0

a/b + b/a - 34 = 0

soit x = a/b

se rappeler que si x = a/b alors 1/x = b/a

et << a/b + b/a - 34 = 0 >> devient:

x + 1/x - 34 = 0

(x + 1/x - 34)·x = 0·x

x² + 1 - 34x = 0

x² - 34x + 1 = 0

Δ = (-34)² - 4·1·1 = 1156 - 4 = 1152

√Δ = +/-√1152 = +/-√(24²·2) = +/-24√2

pour √Δ = +24√2: x = (-(-34) + 24√2)/2·1 = (34 + 24√2)/2 = 17 + 12√2

pour √Δ = -24√2: x = (-(-34) - 24√2)/2·1 = (34 - 24√2)/2 = 17 - 12√2

et comme x = a/b, alors:

.------------------.
| a/b = 17 + 12√2 |
.------------------.
| a/b = 17 - 12√2 |
.------------------.

$a + b = 6\sqrt{ab}$

hypothèse: a et b sont réels et $ab > 0$

$(a + b)/b = (6\sqrt{ab})/b$

$a/b + 1 = 6\sqrt{a/b}$

soit $x = \sqrt{a/b}$

$x^2 + 1 = 6x$

$x^2 - 6x + 1 = 0$

$\Delta = (-6)^2 - 4 \cdot 1 \cdot 1 = 36 - 4 = 32$

$\sqrt{\Delta} = +/-\sqrt{32} = +/-\sqrt{(2^2 \cdot 8)} = +/-2\sqrt{8}$

pour $\sqrt{\Delta} = +2\sqrt{8}$: $x = (-(-6) + 2\sqrt{8})/2 \cdot 1 = (6 + 2\sqrt{8})/2 = 3 + \sqrt{8}$

pour $\sqrt{\Delta} = -2\sqrt{8}$: $x = (-(-6) - 2\sqrt{8})/2 \cdot 1 = (6 - 2\sqrt{8})/2 = 3 - \sqrt{8}$

----- $x = 3 + \sqrt{8}$ -----

$\sqrt{a/b} = x = 3 + \sqrt{8}$

$(\sqrt{a/b})^2 = (3 + \sqrt{8})^2$

$a/b = 9 + 2 \cdot 3 \cdot \sqrt{8} + 8$

$a/b = 17 + 6\sqrt{8}$

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.------------------.
| a/b = 17 + 12√2  |
.------------------.
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----- $x = 3 - \sqrt{8}$ -----

$\sqrt{a/b} = x = 3 - \sqrt{8}$

$(\sqrt{a/b})^2 = (3 - \sqrt{8})^2$

$a/b = 9 - 2 \cdot 3 \cdot \sqrt{8} + 8$

$a/b = 17 - 6\sqrt{8}$

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.------------------.
| a/b = 17 - 12√2  |
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