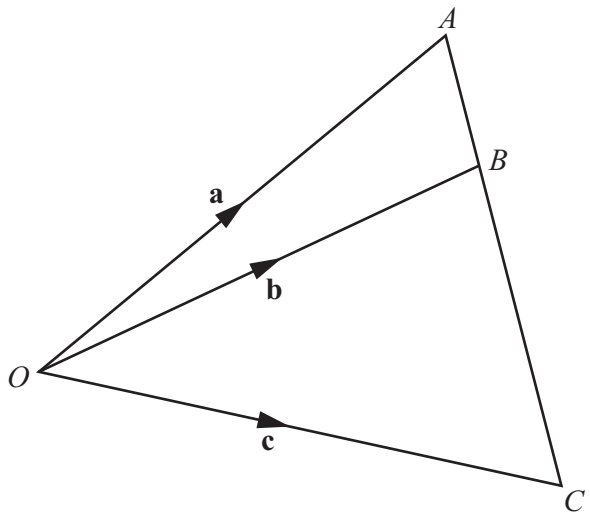
3 **(a)** Solve the equation $8^{\frac{1}{x}} - 2 \times 8^{-\frac{1}{x}} = 1$. [4]

(b) It is given that $\left(a - \sqrt{3}\right)^2 = b + \left(3 - b\right)\sqrt{3}$, where a and b are integers. Find the possible values of a and b. [6]

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The diagram shows the triangle OAC. The point B lies on AC such that $AB:BC = p:q$, where p and q are constants ($p \neq -q$).

$\overrightarrow{OA} = \mathbf{a}$, $\overrightarrow{OB} = \mathbf{b}$ and $\overrightarrow{OC} = \mathbf{c}$.

Show that $\mathbf{b} = \dfrac{q\mathbf{a} + p\mathbf{c}}{q+p}$. [5]

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