

Is $\sqrt[3]{\sqrt{5} + 2} + \sqrt[3]{\sqrt{5} - 2}$ really 1?

TASK 1 Simplify $(\sqrt{5} + 2)^3 (\sqrt{5} - 2)^3$

TASK 2 Let $x = \sqrt[3]{\sqrt{5} + 2} + \sqrt[3]{\sqrt{5} - 2}$ and determine x^3

TASK 3 Find a 3rd degree polynomial that has x as a root; find all three roots.

TASK 4 Show that $\sqrt[3]{26 + 15\sqrt{3}} + \sqrt[3]{26 - 15\sqrt{3}} = 4$ and that

$$\sqrt[3]{7 + \sqrt{50}} + \sqrt[3]{7 - \sqrt{50}} = 2$$