To find the fifth root, identify all fifth roots within the radical: $\sqrt[5]{192a^7b^{12}c^{11}} = \sqrt[5]{2^5 \cdot 6 \cdot a^5 \cdot a^2 \cdot \left(b^2\right)^5 \cdot b^2 \cdot \left(c^2\right)^5} \cdot c.$ Then pull out the roots and simplify the expression: $2ab^2c^2\sqrt[5]{6a^2b^2c}.$