

Simplify the following radical expression. $\sqrt[3]{-27x^9y^{12}}$.

$$\sqrt[3]{-27x^9y^{12}} = \sqrt[3]{(-3)^3(x^3)^3(y^4)^3} \quad (a^m)^n = a^{mn}$$

$$= \sqrt[3]{(-3)^3} \sqrt[3]{(x^3)^3} \sqrt[3]{(y^4)^3} \quad \sqrt[n]{ab} = \sqrt[n]{a} \cdot \sqrt[n]{b}$$

$$= (-3)(x^3)(y^4)$$

$$= -3x^3y^4$$