

Use the lists below to help...

Perfect Cubes: $2^3 = \boxed{8}$ $3^3 = \boxed{27}$ $4^3 = \boxed{64}$ $5^3 = \boxed{125}$ $6^3 = \boxed{216}$ Perfect Powers of Six: $2^6 = \boxed{64}$ Perfect Powers of Four: $2^4 = \boxed{16}$ $3^4 = \boxed{81}$ $4^4 = \boxed{256}$ Perfect Powers of Seven: $2^7 = \boxed{128}$ Perfect Powers of Five: $2^5 = \boxed{32}$ $3^5 = \boxed{243}$ Perfect Powers of Eight: $2^8 = \boxed{256}$

Simplify or solve for x for the following problems. No decimal solutions. MUST SHOW ALL WORK.

$$\begin{aligned} B \quad 1) & -2\sqrt[3]{32x^2y} \\ & -2\sqrt[3]{8 \cdot 4x^2y} = \\ & -2 \cdot 2\sqrt[3]{4x^2y} = \\ & -4\sqrt[3]{4x^2y} \end{aligned}$$

$$\begin{aligned} C \quad 2) & 125^{2/3} \\ & (125^{1/3})^2 = \\ & 5^2 = \\ & 25 \end{aligned}$$

$$\begin{aligned} B \quad 3) & 3\sqrt[3]{81m^2n^4p^3} \\ & 3\sqrt[3]{27 \cdot 3m^2n^3np^3} = \\ & 3 \cdot 3 \cdot n \cdot p \sqrt[3]{3m^2n} = \\ & 9np\sqrt[3]{3m^2n} \end{aligned}$$

$$\begin{aligned} D \quad 4) & -3\sqrt[4]{6} - 3\sqrt[4]{32} - 2\sqrt[4]{32} \\ & -3\sqrt[4]{6} - 3\sqrt[4]{16 \cdot 2} - 2\sqrt[4]{16 \cdot 2} = \\ & -3\sqrt[4]{6} - 3 \cdot 2\sqrt[4]{2} - 2 \cdot 2\sqrt[4]{2} = \\ & -3\sqrt[4]{6} - 6\sqrt[4]{2} - 4\sqrt[4]{2} = \\ & -3\sqrt[4]{6} - 10\sqrt[4]{2} \end{aligned}$$

$$\begin{aligned} D \quad 5) & \sqrt[3]{4x^3} \cdot \sqrt[3]{3x^2} \\ & \sqrt[3]{4 \cdot 3x^3x^2} = \\ & \sqrt[3]{12x^3x^2} = \\ & x\sqrt[3]{12x^2} \end{aligned}$$

$$\begin{aligned} C \quad 6) & \frac{1}{4}x^3 - 24 = -8 \\ & \quad \quad \quad +24 \quad +24 \\ & 4 \cdot \frac{1}{4}x^3 = 16 \cdot 4 \\ & \sqrt[3]{x^3} = \sqrt[3]{64} \\ & x = 4 \end{aligned}$$

$$\begin{aligned} C \quad 7) & \sqrt[3]{-3y^3} \cdot -2\sqrt[3]{36y^4} \\ & y\sqrt[3]{-3} \cdot -2y\sqrt[3]{36y} = \\ & -2y^2\sqrt[3]{-108y} = \\ & -2y^2\sqrt[3]{-27 \cdot 4y} = \\ & -2 \cdot -3y^2 \cdot \sqrt[3]{4y} = 6y^2\sqrt[3]{4y} \end{aligned}$$

$$\begin{aligned} C \quad 8) & \frac{\sqrt[4]{3}}{\sqrt[4]{64}} \cdot \frac{\sqrt[4]{4}}{\sqrt[4]{4}} = \\ & \frac{\sqrt[4]{12}}{\sqrt[4]{256}} = \frac{\sqrt[4]{12}}{4} \end{aligned}$$

$$\begin{aligned} D \quad 9) & 4(x+5)^4 - 13 = 51 \\ & \quad \quad \quad +13 \quad +13 \\ & \frac{4(x+5)^4}{4} = \frac{64}{4} \\ & \sqrt[4]{(x+5)^4} = \sqrt[4]{16} \\ & x+5 = \pm 2 \\ & x = -5 \pm 2 \quad x = -3, -7 \end{aligned}$$

$$\begin{aligned} A \quad 10) & \sqrt[4]{288} \\ & \begin{array}{c} 4 \quad 12 \\ \textcircled{2} \textcircled{2} \quad \textcircled{8} \textcircled{4} \\ 4 \textcircled{2} \textcircled{3} \textcircled{3} \end{array} \\ & 2^4\sqrt[4]{2 \cdot 3^2} = \\ & \begin{array}{c} 2 \quad 2 \\ \textcircled{2} \textcircled{2} \end{array} \quad 2^4\sqrt[4]{18} \end{aligned}$$

$$\begin{aligned} B \quad 11) & (81m^6)^{1/2} \\ & 81^{1/2} m^{6/2} = \\ & 9m^3 \end{aligned}$$

$$\begin{aligned} B \quad 12) & \frac{\sqrt[5]{y^{10}}}{\sqrt[5]{2x^2}} \cdot \frac{\sqrt[5]{16x^3}}{\sqrt[5]{16x^3}} = \\ & \frac{\sqrt[5]{16y^{10}x^3}}{\sqrt[5]{32x^5}} = \frac{y^2\sqrt[5]{16x^3}}{2x} \end{aligned}$$

$$\begin{aligned} C \quad 13) & 3\sqrt[3]{y} + 5\sqrt[3]{27y} \\ & 3\sqrt[3]{y} + 5 \cdot 3\sqrt[3]{y} = \\ & 3\sqrt[3]{y} + 15\sqrt[3]{y} = \\ & 18\sqrt[3]{y} \end{aligned}$$

$$\begin{aligned} A \quad 14) & \frac{-3x}{\sqrt[5]{x^6}} \cdot \frac{\sqrt[5]{x^4}}{\sqrt[5]{x^4}} = \\ & \frac{-3x\sqrt[5]{x^4}}{\sqrt[5]{x^{10}}} = \frac{-3x\sqrt[5]{x^4}}{x^2} = \\ & \frac{-3\sqrt[5]{x^4}}{x} = \frac{-3x^{4/5}}{x} \end{aligned}$$

$$\begin{aligned} B \quad 15) & \sqrt[5]{8} \cdot \sqrt[5]{8} = \sqrt[5]{64} = \\ & \sqrt[5]{32 \cdot 2} = \\ & 2\sqrt[5]{2} \end{aligned}$$