

Warm Up #3

- 1. Get a textbook**
- 2. Complete the real numbers handout**
- 3. Work in silence until you get to Example 11**
- 4. Grade your paper**

$$8) (4q)^{-3} = \frac{1}{(4q)^3} = \frac{1}{4^3 \cdot q^3} = \frac{1}{64q^3}$$

A.1 Radicals and Rational Exponents pg. 847

Objective: Review basic algebraic skills as radicals and simplifying radical expressions

Questions: 11; 18; 20; 22; 28; 33; 42; 46; 51; 54; 56; 68

Question 11

$$\sqrt[3]{-\frac{64}{27}} = \left(-\frac{64}{27}\right)^{\wedge} \left(\frac{1}{3}\right)$$
$$-\frac{4}{3}$$

Question 18

$$16^{5/4} = (16^{1/4})^5 = 2^5 = 32$$

$$16^{(5/4)}$$

Question 20

$$27^{-4/3} = \frac{1}{81}$$

Question 22

$$\left(\frac{-125}{64} \right)^{-\frac{1}{3}} = -\frac{4}{5}$$

Question 28

$$28) \sqrt[3]{500} = \sqrt[3]{2^2 \cdot 5^3}$$

$$500 \begin{array}{l} \swarrow \quad \searrow \\ 2 \quad 250 \\ \swarrow \quad \searrow \\ 2 \quad 125 \\ \swarrow \quad \searrow \quad \searrow \\ 5 \quad 5 \quad 5 \end{array} = 5 \sqrt[3]{4}$$

$$= 5(4)^{1/3}$$

Question 33

$$\sqrt[4]{3x^8y^6} = x^2y\sqrt[4]{3y^2}$$

$$x^{1(2)}y(3y^{1(2)})^{1/4}$$

Question 42

$$\begin{aligned}
 & \sqrt[5]{\frac{a^3}{b^2}} = \frac{a^{\frac{3}{5}}}{b^{\frac{2}{5}}} \cdot \frac{b^{\frac{3}{5}}}{b^{\frac{3}{5}}} \cdot \frac{\sqrt[5]{a^3 b^3}}{\sqrt[5]{a^3 b^3}} \\
 & \frac{\sqrt[5]{a^3 \cdot b^3}}{\sqrt[5]{b^2 \cdot b^3}} = \frac{\sqrt[5]{a^3 b^3}}{\sqrt[5]{b^5}} = \frac{b^{\frac{3}{5}} \sqrt[5]{a^3 b^3}}{b}
 \end{aligned}$$

Question 46

$$xy \sqrt[4]{xy^3}$$

$$xy x^{\frac{1}{4}} y^{\frac{3}{4}}$$

$$x^{1+\frac{1}{4}} y^{1+\frac{3}{4}}$$

$$x^{\frac{5}{4}} y^{\frac{7}{4}}$$

Question 51

The image shows a handwritten mathematical derivation in blue ink. It consists of two rows of equations. The first row shows the simplification of a nested square root: $\sqrt{\sqrt{2x}}$. A red curved arrow with the number '4' above it points from the inner square root to the outer one, indicating the power of 4. The result is shown as $\sqrt[4]{2x}$. The second row shows the simplification of a square root with a fractional exponent: $\sqrt{(2x)^{1/2}}$. This is simplified to $(2x)^{1/4}$, which is then shown to be equivalent to $\sqrt[4]{2x}$.

$$\sqrt{\sqrt{2x}} = \sqrt[4]{2x}$$
$$\sqrt{(2x)^{1/2}} = (2x)^{1/4} = \sqrt[4]{2x}$$

Question 54

$$\sqrt[3]{\sqrt[6]{ab}} = \sqrt[6]{ab} = a^{\frac{1}{6}} b^{\frac{1}{6}}$$

Question 56

$$\sqrt{a} \sqrt[3]{a^2} = a^{\frac{1}{2} + \frac{2}{3}} = a^{\frac{7}{6}}$$

Question 68

$$\begin{aligned} 4^{\frac{1}{5}} &= (2^2)^{\frac{1}{5}} \\ &= 2^{\frac{2}{5}} \end{aligned} \quad \sqrt[5]{\frac{4x^6y}{9x^3}} = \frac{4^{\frac{1}{5}} x^{\frac{6}{5}} y^{\frac{1}{5}}}{9^{\frac{1}{5}}} = \left(\frac{2}{3}\right)^{\frac{2}{5}} x^{\frac{6}{5}} y^{\frac{1}{5}}$$

$9^{\frac{1}{5}} = (3^2)^{\frac{1}{5}} = 3^{\frac{2}{5}}$