Math 2 **N.RN.1 & N.RN.2**

Assessment Title: Check Their Work on Expressions with Rational Exponents
Unit 1: Extending the Number System

Learning Targets:

- I can use properties of integer exponents and apply those to rational exponents.
- I can convert between exponential and radical form.

Directions: Below are examples of different students' work in simplifying the following expressions involving rational exponents. Decide whether or not each example is simplified correctly. If it is not, then identify all errors that were made and state the mathematical property that was used incorrectly.

1. Gregory and Kailiyah are simplifying $\frac{x^{\frac{3}{4}}}{x^{-\frac{1}{2}}}$.

Gregory's work:

$$\frac{x^{3/4}}{x^{-1/2}} = x^{\frac{3}{4}-\frac{1}{2}}$$
$$= x^{\frac{3}{4}-\frac{2}{4}}$$
$$= x^{1/4}$$

Kailiyah's work:

$$\frac{x^{3/4}}{x^{-1/2}} = x^{3/4 \div \left(-\frac{1}{2}\right)}$$
$$= x^{3/4 \cdot \left(-\frac{2}{1}\right)}$$
$$= x^{-\frac{3}{2}}$$

Explanation:

2. Armando and Xavier are simplifying $(2x^3)^{\frac{3}{2}}$.

Armando's work:

$$(2x^3)^{3/2} = \sqrt{(2x^3)^3}$$
$$= \sqrt{8x^9}$$
$$= 2x^4\sqrt{2}$$

Xavier's work:

$$(2x^3)^{3/2} = \sqrt[3]{(2x^3)^2}$$
$$= \sqrt[3]{4x^6}$$
$$= x^2\sqrt[3]{4}$$

Explanation:

Assessment Title: Reviewing Properties of Exponents Pre-Assessment
Unit 1: Extending the Number System

3. Cecilia and Hailey are simplifying $\sqrt{25x^4 - 9x^4}$.

Cecilia's work:

$\sqrt{25x^4 - 9x^4} = \sqrt{25x^4} - \sqrt{9x^4}$
$= 5x^2 - 3x^2$
$= 2x^2$

Hailey's work:

$\sqrt{25x^4 - 9x^4} = \sqrt{16}$
$= 4$

Explanation:

4. Jaques and Brighton are simplifying $b^{\frac{2}{3}} \cdot b^{\frac{8}{3}}$.

Jaques's work:

$b^{2/3} \cdot b^{8/3} = b^{10/6}$
$= b^{5/3}$

Brighton's work:

$b^{2/3} \cdot b^{8/3} = b^{16/9}$

Explanation:

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5. Manuel and Tristan are simplifying $2^{\frac{2}{5}} \cdot 2^{\frac{2}{5}}$.

Manuel's work:

$2^{2/5} \cdot 2^{2/5} = 4^{4/5}$

Tristan's work:

$2^{2/5} \cdot 2^{2/5} = 4^{2/5}$

Explanation: