Name _____ Mr. Schlansky _____

Date

Algebra II



Fractional Exponents Regents Practice

For Multiple Choice, Use Multiple Choice Strategy!!!!!!

1. Given y > 0, the expression $\sqrt{3x^2y} \cdot \sqrt[3]{27x^3y^2}$ is equivalent to 1) $81x^5y^3$ 2) $3^{15}x^2y$ 3) $3^{\frac{5}{2}}x^{\frac{5}{3}}$ 4) $3^{\frac{3}{2}}x^2y^{\frac{7}{6}}$

2. The expression
$$\left(\frac{m^2}{\frac{1}{m^3}}\right)^{-\frac{1}{2}}$$
 is equivalent to
1) $-\sqrt[6]{m^5}$ 3) $-m\sqrt[5]{m}$
2) $\frac{1}{\sqrt[6]{m^5}}$ 4) $\frac{1}{m\sqrt[5]{m}}$

3. Which equation is equivalent to
$$P = 210x^{\frac{4}{3}}y^{\frac{7}{3}}$$

1) $P = \sqrt[3]{210x^4y^7}$
2) $P = 70xy^2\sqrt[3]{xy}$
3) $P = 210xy^2\sqrt[3]{xy}$
4) $P = 210xy^2\sqrt[3]{x^3y^5}$

4. For
$$x \ge 0$$
, which equation is *false*?
1) $(x^{\frac{3}{2}})^2 = \sqrt[4]{x^3}$
2) $(x^3)^{\frac{1}{4}} = \sqrt[4]{x^3}$
3) $(x^{\frac{3}{2}})^{\frac{1}{2}} = \sqrt[4]{x^3}$
4) $(x^{\frac{2}{3}})^2 = \sqrt[3]{x^4}$

5. For $x \neq 0$, which expressions are equivalent to one divided by the sixth root of x?

I.
$$\frac{6\sqrt{x}}{\sqrt[3]{x}}$$
 II. $\frac{x^{\frac{1}{6}}}{x^{\frac{1}{3}}}$ III. $x^{\frac{-1}{6}}$
1) I and II, only
2) I and III, only
4) I, II, and III

Express the following in simplest form, with a rational exponent. 6. $a\sqrt[5]{a^4}$ 7. $2xy^2\sqrt[3]{x^2y}$

8.
$$\frac{\sqrt[3]{x^2} \cdot \sqrt{x^5}}{\sqrt[6]{x}}$$
9.
$$\frac{x\sqrt{x^3}}{\sqrt[3]{x^5}}$$

Express the following in simplest radical form:

$$10. \frac{x^{\frac{1}{5}}}{x^{\frac{1}{2}}} \qquad \qquad 11. \left(\frac{1}{x^{-2}}\right)^{-\frac{3}{4}}$$

$$12. \frac{2x^{\frac{3}{2}}}{\left(16x^{4}\right)^{\frac{1}{4}}} \qquad \qquad 13. \frac{\left(x^{2}y^{4}\right)^{\frac{1}{3}}}{xy}$$

Determine the value of n in each of the following equations:

$$14. \ \frac{\sqrt[3]{x^8}}{(x^4)^{\frac{1}{3}}} = x^n \qquad \qquad 15. \left(\frac{1}{\sqrt[3]{y^2}}\right) y^4 = y^n \qquad \qquad 16. \left(\frac{y^{\frac{17}{8}}}{y^{\frac{5}{4}}}\right)^4 = y^n$$

17. Kenzie believes that for $x \ge 0$, the expression $\left(\sqrt[7]{x^2}\right) \left(\sqrt[5]{x^3}\right)$ is equivalent to $\sqrt[35]{x^6}$. Is she correct? Justify your response algebraically.

18. Justify why
$$\frac{\sqrt[3]{x^2y^5}}{\sqrt[4]{x^3y^4}}$$
 is equivalent to $x^{\frac{-1}{12}y^{\frac{2}{3}}}$ using properties of rational exponents, where $x \neq 0$ and $y \neq 0$.

19. For *n* and
$$p > 0$$
, is the expression $\left(p^2 n^{\frac{1}{2}}\right)^8 \sqrt{p^5 n^4}$ equivalent to $p^{18} n^6 \sqrt{p}$? Justify your answer.