1) Radicals are fractional exponents
2) Get rid of parenthesis
3) Negative exponents are fractions
4) Clean it up ← multiply, divide, radical

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Algebra II

Given Radicals

1. Express the following without using radicals:

a) $\sqrt[2]{x^2y^5}$ $(x^2y^5)^{\frac{1}{2}}$ $x^1y^{\frac{5}{2}}$ $xy^{\frac{5}{2}}$

b) $\sqrt[3]{27x^6y^8}$ $(27x^6y^8)^{\frac{1}{3}}$ $27^{\frac{1}{3}}x^2y^{\frac{8}{3}}$ $3x^2y^{\frac{8}{3}}$

c) $(\sqrt[2]{25x^3y^4})^3$ $(25x^3y^4)^{\frac{3}{2}}$ $25^{\frac{3}{2}}x^{\frac{9}{2}}y^6$ $125x^{\frac{9}{2}}y^6$

d) $(\sqrt[4]{4x^5y^8})^{-2}$ $(4x^5y^8)^{-\frac{2}{4}}$ $(4x^5y^8)^{-\frac{1}{2}}$ $4^{\frac{1}{2}}x^{-\frac{5}{2}}y^{-4}$ $\frac{1}{4^{\frac{1}{2}}x^{\frac{5}{2}}y^4} = \frac{1}{2x^{\frac{5}{2}}y^4}$

2. The expression $\sqrt[4]{16x^2y^7}$ is equivalent to

1) ~~$2x^{\frac{1}{2}}y^{\frac{7}{4}}$~~
2) $2x^8y^{28}$
3) $4x^{\frac{1}{2}}y^{\frac{7}{4}}$
4) $4x^8y^{28}$

$(16x^2y^7)^{\frac{1}{4}}$ $16^{\frac{1}{4}}x^{\frac{1}{2}}y^{\frac{7}{4}}$ $2x^{\frac{1}{2}}y^{\frac{7}{4}}$

3. The expression $\sqrt[4]{81x^2y^5}$ is equivalent to

1) ~~$3x^{\frac{1}{2}}y^{\frac{5}{4}}$~~
2) $3x^{\frac{1}{2}}y^{\frac{4}{5}}$
3) $9xy^{\frac{5}{2}}$
4) $9xy^{\frac{2}{5}}$

$(81x^2y^5)^{\frac{1}{4}}$ $81^{\frac{1}{4}}x^{\frac{1}{2}}y^{\frac{5}{4}}$ $3x^{\frac{1}{2}}y^{\frac{5}{4}}$

4. Which expression is equivalent to $(\sqrt[2]{a^2b^{\frac{1}{2}}})^{-1}$?

(1) $a^{-2}b^{-\frac{1}{2}}$
(2) $-ab^{\frac{1}{4}}$
(3) $-ab^2$
(4) ~~$\frac{1}{ab^{\frac{1}{4}}}$~~

$(a^2b^{\frac{1}{2}})^{-\frac{1}{2}}$ $a^{-1}b^{-\frac{1}{4}}$ $\frac{1}{a^1b^{\frac{1}{4}}}$

5. Express in simplest form:

$$\sqrt[3]{\frac{a^6b^9}{-64}}$$

$$\left(\frac{a^6b^9}{-64}\right)^{\frac{1}{3}} \quad \frac{a^2b^3}{(-64)^{\frac{1}{3}}} = \frac{a^2b^3}{-4}$$

6. Express in simplest form:

$$\sqrt[4]{\frac{x^7y^{12}}{81}}$$

$$\left(\frac{x^7y^{12}}{81}\right)^{\frac{1}{4}} \quad \frac{x^{\frac{7}{4}}y^3}{81^{\frac{1}{4}}} = \frac{x^{\frac{7}{4}}y^3}{3}$$

7. Express in simplest form:

$$\sqrt[3]{\frac{x^{-6}y^{12}}{27z^{-9}}}$$

$$\left(\frac{x^{-6}y^{12}}{27z^{-9}}\right)^{\frac{1}{3}} \quad \frac{x^{-2}y^4}{27^{\frac{1}{3}}z^{-3}} \quad \frac{y^4z^3}{3x^2} = \frac{y^4z^3}{3x^2}$$

8. Express in simplest form:

$$\sqrt{\frac{64m^{-2}n^5}{25z^{-8}}}$$

$$\left(\frac{64m^{-2}n^5}{25z^{-8}}\right)^{\frac{1}{2}} \quad \frac{64^{\frac{1}{2}}m^{-1}n^{\frac{5}{2}}}{25^{\frac{1}{2}}z^{-4}} \quad \frac{8n^{\frac{5}{2}}z^4}{5m}$$

9. Express in simplest form:

$$\sqrt[5]{\frac{x^{-10}y^7}{z^{-8}}}$$

$$\left(\frac{x^{-10}y^7}{z^{-8}}\right)^{\frac{1}{5}} \quad \frac{x^{-2}y^{\frac{7}{5}}}{z^{-\frac{8}{5}}} = \frac{y^{\frac{7}{5}}z^{\frac{8}{5}}}{x^2}$$