

Look at this!

Simplify. Express answers with positive exponents.

$$\left(\frac{(x^3y)^{-1}(x^4y^3)}{(x^2y^{-3})^{-2}} \right)^{-1}$$

$$\textcircled{1} = \frac{(x^2y^{-3})^{-2}}{(x^3y)^{-1}(x^4y^3)}$$

the negative exponent means
"take the reciprocal"
(Flip it!)

$$\textcircled{2} = \frac{x^{2(-2)} y^{-3(-2)}}{(x^{3(-1)} y^{-1})(x^4 y^3)}$$

I used the power of a power
rule to deal with the exponent
-2 and -1.

$$\textcircled{3} = \frac{x^{-4} y^6}{(x^{-3} y^{-1})(x^4 y^3)}$$

I just simplified the exponents
I was multiplying in step $\textcircled{2}$

$$\textcircled{4} = \frac{x^{-4} y^6}{x^{-3+4} y^{-1+3}}$$

I applied the product rule on
the bottom

$$\textcircled{5} = \frac{x^{-4} y^6}{x^1 y^2}$$

Simplified exponents from step $\textcircled{4}$

$$\textcircled{6} = x^{-4-1} y^{6-2}$$

Quotient rule!

$$\textcircled{7} = x^{-5} y^4$$

Simplified exponents from step $\textcircled{6}$

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

Negative exponent \Rightarrow reciprocal with
positive exponent

Oh, would ya look at this!

Simplify. Express answer in rational form with positive exponents.

Show, and explain, all of your work!

$$\left(\frac{(x^{18})^{-\frac{1}{6}}}{\sqrt[5]{243x^{10}}} \right)^{0.5}$$

$$= \left(\frac{x^{18(\frac{1}{6})}}{(243x^{10})^{\frac{1}{5}}} \right)^{\frac{1}{2}}$$

$$= \left(\frac{x^{\frac{-18}{6}}}{243^{\frac{1}{5}} x^{10(\frac{1}{5})}} \right)^{\frac{1}{2}}$$

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

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

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

$$= \left(\frac{1}{3} x^{-5} \right)^{\frac{1}{2}}$$

$$= \left(\frac{1}{3} \right)^{\frac{1}{2}} (x^{-5})^{\frac{1}{2}}$$

$$= \frac{\sqrt{1}}{\sqrt{3}} x^{-\frac{5}{2}}$$

final answer

$$\Rightarrow \frac{1}{\sqrt{3}x^{\frac{5}{2}}}$$

$$\Rightarrow \frac{1}{\sqrt{3x^5}}$$

A: Power of a power rule

B: $\sqrt[n]{n} = n^{\frac{1}{n}}$

C: $0.5 = \frac{1}{2}$

A: Power of a power rule

B: Power of a power rule

C: Power of a power rule

A: Simplified $\frac{-18}{6}$ to -3

B: simplified $243^{\frac{1}{5}}$ ($\sqrt[5]{243}$) = 3

C: $10 \times \frac{1}{5} = \frac{10}{5}$

A: Coefficient is $\frac{1}{3}$

B: Quotient Rule on base of X

A: Simplified $-3-2$ to -5

Distributed exponent of $\frac{1}{2}$

Exponent $\frac{1}{2}$ is just $\sqrt{\quad}$

The exponent $\frac{-5}{2}$ changes to $\frac{5}{2}$ in denominator
remember that $x^{\frac{-5}{2}} = \sqrt{x^5}$ (combined the $\frac{1}{\sqrt{3}}$ with $\sqrt{x^5}$)