

## Exponent Laws - Tougher

$$\text{Ex 1) } (25a^4b^2)^{\frac{3}{2}}$$
$$(25)^{\frac{3}{2}} (a^4)^{\frac{3}{2}} (b^2)^{\frac{3}{2}}$$

$$(\sqrt{25})^3 a^{\frac{12}{2}} b^{\frac{6}{2}}$$

$$5^3 a^6 b^3$$

$$\boxed{125a^6b^3}$$

Distribute the power to everything inside the brackets.

Apply power of a power rule (multiply each pair of exponents)

Use bottom out rule to simplify radical and simplify exponents on variables.

$$\text{Ex 2) } \frac{6x^4y^{-3}}{14xy^2}$$

$$\frac{3}{7} x^3 y^{-5}$$

$$\boxed{\frac{3x^3}{7y^5}}$$

Divide each pair. Simplify coefficient and subtract exponents for variables.

Take reciprocal of negative exponents to make all exponents positive.

$$\text{Ex 3) } \left( \frac{50x^2y^4}{2x^4y^7} \right)^{\frac{1}{2}}$$

$$(25x^{-2}y^{-3})^{\frac{1}{2}}$$

Divide each pair first. Subtract exponents on variables.

$$(25)^{\frac{1}{2}}(x^{-2})^{\frac{1}{2}}(y^{-3})^{\frac{1}{2}}$$

Distribute the power to everything inside the brackets.

$$\sqrt{25} x^{-1} y^{-\frac{3}{2}}$$

Apply power of a power rule (multiply each each of exponents)

$$\boxed{\frac{5}{xy^{\frac{3}{2}}}}$$

Use bottom out rule to simplify radical and take reciprocal of exponents to make them positive.

$$\text{Ex 4) } \frac{-12x^{-5}y^2}{3x^{\frac{1}{2}}y^{-\frac{1}{2}}}$$

$$\begin{array}{l} x^{-5-\frac{1}{2}} \\ x^{\frac{-10}{2}-\frac{1}{2}} \\ y^{\frac{2}{2}-(-\frac{1}{2})} \end{array}$$

$$-4x^{-\frac{11}{2}}y^3$$

Divide each pair. Subtract exponents for each variable.

$$\boxed{\frac{-4y^3}{x^{\frac{11}{2}}}}$$

Take reciprocal of exponents to make them positive. Do not move negative coefficients. Only exponents.