Recall:

$$x^n \cdot x^m = x^{n+m} \qquad x^3 \cdot x^5 = x^8$$

$$\frac{x^n}{x^m} = x^{n-m} \qquad \frac{x^7}{x^2} = x^5$$

$$(x^n)^m = x^{n \cdot m} \qquad (x^5)^4 = x^{20}$$

$$(x \cdot y)^n = x^n y^n$$

$$\left(\frac{x}{y}\right)^n = \frac{x^n}{y^n}$$

Examples:

1) $(x^3 y^4)^6$

$= (x^3)^6 (y^4)^6$

$= X^{3 \cdot 6} Y^{4 \cdot 6}$

$= \boxed{X^{18} Y^{24}}$

2) $(2X^3Y^2)^4$

$= (2)^4 (X^3)^4 (Y^2)^4$

$2 \cdot 2 \cdot 2 \cdot 2$ $\quad 4 \cdot 4$ $\quad 3 \cdot 4$ $\quad 2 \cdot 4$

$= 16 X^{12} Y^8$

$= \boxed{16 X^{12} Y^8}$

Negative Exponents

$$\boxed{a^{-n} = \frac{1}{a^n}}$$

Examples.

1) $X^{-3} = \frac{1}{X^3}$

2) $Y^{-4} = \frac{1}{Y^4}$

3) $(2X)^{-2} = \frac{1}{(2X)^2}$

$= \frac{1}{(2)^2(X)^2}$

$= \boxed{\frac{1}{4X^2}}$

4) $\frac{X^3}{X^5} = X^{3-5}$

$= X^{-2}$

Note: For Final answers

$$= \boxed{\frac{1}{x^2}}$$

only positive exponent are allowe

5) $\dfrac{x^{-4}}{x^{2}}$

$= x^{(-4)-(2)}$ } Recall: $-4-2=-$

$= x^{-6}$

$= \boxed{\dfrac{1}{x^6}}$

6) $\dfrac{24a^{2}b^{-3}}{2(a^{2})^{4}}$

$$= \frac{12\,a^{2}\,b^{-3}}{a^{2\cdot 4}}$$

$$= \frac{12\,a^{2}\,b^{-3}}{a^{8}}$$

$$= 12\,a^{2-8}\,b^{-3}$$

$$= 12\,a^{-6}\,b^{-3}$$

$$= 12\,\frac{1}{a^{6}}\,\frac{1}{b^{3}}$$

$$= \boxed{\frac{12}{a^{6}b^{3}}}$$