

5-2 Exponents raised to a power
Multiply the powers for each component

$$(x^2)^4 = x^{2 \cdot 4} = x^8$$

$$(2a^2b^{-3})^3 =$$

$$\frac{8a^6}{b^9}$$

$\left(-\frac{1}{2}\right)^4$ Put the negative sign with the numerator

$$= \frac{(-1)^4}{(2)^4} = \frac{(-1)^4}{(2^1)^4} = \frac{(-1)^4}{2^4} = \frac{1}{16}$$

$\left(\frac{x}{3}\right)^{-4}$ Solve 2 ways:

(a) $\frac{x^{-4}}{3^{-4}}$

$\frac{3^4}{x^4}$

$\frac{81}{x^4}$

$$\textcircled{b} \left(\frac{x}{3}\right)^{-4} = \left(\frac{3}{x}\right)^4 = \frac{3^{1 \cdot 4}}{x^{1 \cdot 4}} = \frac{3^4}{x^4} = \frac{81}{x^4}$$

Inverse gets rid of negative exponent or you can do it regular way:

$$\frac{x^{1 \cdot -4}}{3^{1 \cdot -4}} = \frac{x^{-4}}{3^4} = \frac{3^4}{x^4}$$

Do 1 - 5 Examples and Practice on p. 264 - 266

Practice

	1	2	3	4	5
a	2^{15}	$32x^{15}$	$\frac{b^{15}}{27a^3}$	$\frac{c^3}{125a^{36}b^3}$	$3^3 x^9$
b	$5^4 = 625$	$\frac{9}{25}$	y^{15}	$\frac{16x^{16}y^4}{25}$	y^{5b+3}
c	$\frac{1}{3^3} = \frac{1}{27}$	$\frac{16a^{20}}{b^{28}}$	$\frac{64}{9}$		
d	x^{24}	$9x$	$\frac{b^8}{81a^6}$		
e		$\frac{a^4 b^{10}}{c^8}$			

Operations with Scientific Notation:

- 1) Multiply the #s.
- 2) Add the exponents, because you are multiplying in the problem.
- 3) Convert to scientific notation (the decimal must be between the first 2 numbers).

$$(7 \times 10^3)(3 \times 10^{-5})$$

$$\textcircled{1} 7 \times 3 = 21$$

$$\textcircled{2} 10^3 + -5 = 10^{-2}$$

$$21 \times 10^{-2+1}$$
$$\textcircled{2.1 \times 10^{-1}}$$

$$(8.1 \times 10^5)(5 \times 10^{-7})$$

$$\begin{array}{r} 8.1 \\ \times 5 \\ \hline \end{array} \textcircled{1}$$

$$40.5 \times 10^{5+(-7)}$$

$$\begin{array}{r} 81 \\ \times 5 \\ \hline 405 \end{array}$$

$$40.5 \times 10^{-2+1}$$

$$4.05 \times 10^{-1}$$

$$\frac{4 \times 10^3}{2 \times 10^2} = (2 \times 10^1)$$

$$\frac{4}{2} = 2$$

$$10^{3-2} = 10^1$$

$$\frac{4.6 \times 10^2}{9.2 \times 10^{-8}} = .5 \times 10^{2-(-8)}$$

$$\frac{4.6}{9.2} = 9.2 \overline{)4.6}$$

$9.2 \overline{)46.0}$

(5)

$$.5 \times 10^{10-1}$$

(5 × 10⁹)

$$\frac{1.2 \times 10^4}{3 \times 10^{-2}}$$

$$10^{4-(-2)} = 10^6$$

$$3 \overline{) 1.2} \begin{array}{r} .4 \\ 12 \\ \hline 0 \end{array}$$

$$4 \times 10^6$$

$$4 \times 10^5$$

