

(Introduction)

Exponent Laws I

a) Product of Powers

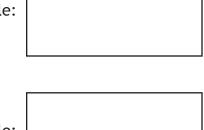
$$2^3 \times 2^4 = \left(\frac{3}{4}\right)^3 \left(\frac{3}{4}\right)^2 =$$

- b) Quotient of Powers
 - $(-6)^8 \div (-6)^5 = \frac{7^9}{7^7} =$
- c) Power of a Power
 - $(2^5)^3 = ((-3)^2)^4 =$
- d) Power of a Product
 - $\left(a^2b^5\right)^3 = \left(4a^3b^2\right)^4 =$
- e) Power of a Quotient
 - $\left(\frac{a^3}{b^5}\right)^3 =$
- f) Exponent of Zero

 $\left(\frac{3mn^2}{7p^6q^4}\right)^0 =$

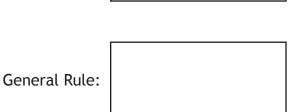
 $\left(\frac{2a^6}{3b^4}\right)^3 =$

General	Rule:



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$$\begin{pmatrix}
a^{m} \times a^{n} = a^{m+n} & (a^{m}b^{n})^{p} = a^{mp}b^{np} \\
\frac{a^{m}}{a^{n}} = a^{m-n} & \left(\frac{a^{m}}{b^{n}}\right)^{p} = \frac{a^{mp}}{b^{np}} \\
(a^{m})^{n} = a^{mn} & a^{0} = 1
\end{pmatrix}$$

Example 1)

Simplify each of the following expressions.

a) $2^3 \times 2^4$

b)
$$\frac{3^9}{3^6}$$

c) $\left(\frac{2a^2}{b}\right)^3$ d) $3(3^5)$

e) $\frac{7^4}{7}$

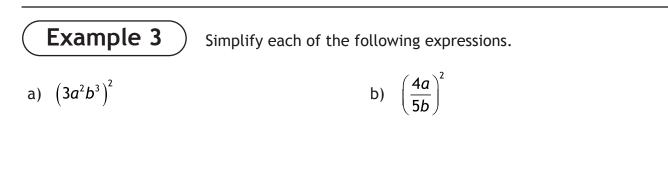
f) $(3a^2)^3$

$$\begin{bmatrix} a^{m} \times a^{n} = a^{m+n} & (a^{m}b^{n})^{p} = a^{mp}b^{np} \\ \frac{a^{m}}{a^{n}} = a^{m-n} & \left(\frac{a^{m}}{b^{n}}\right)^{p} = \frac{a^{mp}}{b^{np}} \\ (a^{m})^{n} = a^{mn} & a^{0} = 1 \end{bmatrix}$$
Numbers, Radicals, and Exponents *LESSON FIVE - Exponents I*
Lesson Notes

c)
$$(7a^2b^5)(-3ab^6)$$
 d) $\frac{36ab^2}{6b}$

e)
$$\frac{10a^8b}{15a^6c}$$
 f) $\frac{(3ab)(2ab)^2}{2(ab)^3}$

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(a^{m})^{n} = a^{mn} & a^{0} = 1
\end{pmatrix}$$



c)
$$\left(\frac{16a^2b^5}{20ab^3}\right)^3$$
 d) $\left(-\frac{3a}{2b}\right)^0$

e)
$$\left(\frac{2a}{b}\right)^{2} \left(ab\right)^{0} \left(-\frac{1}{2}\right)^{3}$$
 f) $\frac{1}{25a^{6}} \left(5a^{5}\right)^{2}$

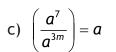
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\end{pmatrix}$$



For each of the following, find a value for m that satisfies the equation.

a)
$$(a^2)^m = a^{10}$$

b) $a^{2m} \times a^8 = a^{14}$



d)
$$\left(\frac{a^m \times a^{2m}}{a}\right) = a^{20}$$