Exponent Laws

RaiseMyMarks.com

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Exponent Laws

1. $$a^m a^n = a^{m+n}$$
2. $$\frac{a^m}{a^n} = a^{m-n},\ a \neq 0$$
3. $$(a^m)^n = a^{mn}$$
4. $$(ab)^m = a^m b^m$$
5. $$\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m},\ b \neq 0$$
6. $$x^0 = 1$$
7. $$x^{-n} = \frac{1}{x^n}, x \neq 0$$
8. $$\frac{1}{x^{-n}} = x^n,\ x \neq 0$$
9. $$\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n,\ a, b \neq 0$$
10. $$a^{p/q} = (\sqrt[q]{a})^p \text{ or } \sqrt[q]{a^p}$$
11. $$a^{p/q} = (a^p)^{1/q} = (a^{1/q})^p$$

Exercises

Use the exponent laws to simplify.

(a)

$$\frac{x^5y^2}{x^3y^4}$$

(b)

$$\frac{(3a^2b)^2}{(ab^2)^3}$$

(c) $(xy^2)^3$

(d)

$$\frac{5x^3y^{-4}}{2x^{-2}y^2}$$

(e)

$$\frac{\pi x^2 y}{4xy^3}$$

(f)

$$(ab)^4 \left(\frac{a^{-2}}{b^{-2}}\right)^2$$

(g) $(a^2bc^{-1})^3$

