

Algebra 2

Properties of Exponents

Exponents

base $\longrightarrow$ 2^3 $\longleftarrow$ power

means $\longrightarrow 2 \cdot 2 \cdot 2$

Exponents are used to indicate powers. Their properties are listed below. Assume through out your work that no denominator is equal to zero and that m and n are integers.

$$1) a^0 = 1$$

$$5) a^{-n} = \frac{1}{a^n}$$

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

$$2) a^m \cdot a^n = a^{m+n}$$

$$6) \frac{a^m}{a^n} = a^{m-n}$$

$$3) (ab)^n = a^n b^n$$

$$7) \left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$$

$$4) (a^m)^n = a^{mn}$$

(erase the answers)

Simplify:

$$1) (7a^2)(-2a^{-5})$$

$a^{2+(-5)}$

$$-14a^{-3} = \boxed{\frac{-14}{a^3}}$$

$$2) (-2x^{-1}y^2)^3$$
$$(-2)^3 (x^{-1})^3 (y^2)^3$$
$$(-2)^3 x^{-3} y^6$$
$$\boxed{\frac{-8y^6}{x^3}}$$

$$3) \frac{2\cancel{a}b^{\cancel{5}}c^{\cancel{2}}}{\cancel{a}^3\cancel{b}c^{\cancel{2}}}$$

$$\boxed{\frac{2b^4}{a^2}}$$

$$4) (4a^2b)^3 (ab)^2$$

$$(4)^3 (a^2)^3 (b)^3 (a)^2 (b)^2$$

$$64 \underline{a^6} \underline{b^3} \underline{a^2} \underline{b^2}$$

$$\boxed{64a^8b^5}$$

$$5) \frac{x^{-2}y^3z^{-1}}{x^{-5}y^6z^3}$$

$$\frac{y^3 x^5}{x^2 z y^6 z^3}$$

$$\frac{x^3 y^3}{x^2 y^6 z^4}$$

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

$$6) \frac{(3a^3)^2}{18a}$$

$$\frac{(3)^2 (a^3)^2}{18a}$$

$$\frac{9a^6}{18a}$$

$$\frac{a^5}{2}$$

$$\frac{a^5}{2}$$

$$7) \frac{c^3 d^7}{c^{-3} d^{-1}}$$

$$\underline{c^3} \underline{d^7} \underline{c^3} \underline{d^1}$$

$$\boxed{c^6 d^8}$$

$$8) \frac{5n + 15}{n + 3}$$

$$\frac{5(\cancel{n+3})}{(\cancel{n+3})}$$

$$\boxed{5}$$

Assignment:
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