

Algebra 1 7.1

Multiply monomials using the properties of exponents

Simplify expressions using properties of exponents

monomial

constant

linear

nonlinear

exponent

base

$$3k^5$$

activity: triangle puzzles (if time)

KeyConcept Power of a Power

Words To find the power of a power, multiply the exponents.

Symbols For any real number a and any integers m and p , $(a^m)^p = a^{m \cdot p}$.

Examples $(b^3)^5 = b^{3 \cdot 5}$ or b^{15} $(g^6)^7 = g^{6 \cdot 7}$ or g^{42}

$$1x^3y^2 \cdot 5x^4y$$

$$5x^{3+4}y^{2+1} = 5x^7y^3$$

KeyConcept Simplify Expressions

To simplify a monomial expression, write an equivalent expression in which:

- ✓ • each variable base appears exactly once,
- ✓ • there are no powers of powers, and
- ✓ • all fractions are in simplest form.

Example 5 Simplify Expressions

Simplify $(3xy^4)^2[(-2y)^2]^3$.

$$\rightarrow (3xy^4)(3xy^4) \cdot [(-2y)(-2y)] \cdot [(-2y)(-2y)] \cdot [(-2y)(-2y)]$$
$$9 \cdot 4 \cdot 4 \cdot 4$$
$$576x^2y^{14}$$

Triangle puzzles

4B. Express the area of a triangle with height $4a$ and base $5ab^2$ as a monomial.



$$\begin{aligned} A &= \frac{1}{2} b h = \frac{b \cdot h}{2} \\ &= \frac{1}{2} (5ab^2) 4a \\ &= \frac{1}{2} \cdot 5 \cdot ab^2 \cdot 4a \\ &= 10a^2b^2 \end{aligned}$$

Order of operations...

Guided Practice

5. Simplify $\left(\frac{1}{2}a^2b^2\right)^3[(-4b)^2]^2$.

$$\left(\frac{1}{2}a^2b^2\right)\left(\frac{1}{2}a^2b^2\right)\left(\frac{1}{2}a^2b^2\right) [(-4b)(-4b)] [(-4b)(-4b)]$$

$$\frac{1}{8} \cdot 16 \cdot 16$$

$$\rightarrow 32a^6b^{10}$$

Circle song?

$$A = \pi r^2$$

$$C = \pi d$$

Triangle puzzle