Algebra 1   7.1
Multiply monomials using the properties of exponents
Simplify expressions using properties of exponents

monomial   number, variable, product
constant
linear
nonlinear
exponent
base

activity: triangle puzzles (if time)
            5 in a row

Determine whether each expression is a monomial. Write *yes* or *no*. Explain your reasoning.

21. 122

yes

22. $3a^4$

yes

23. $2c + 2$

no

Simplify each expression.

27. $(q^2)(2q^4)$

$\downarrow$

$1 \cdot q \cdot q \cdot 2 \cdot q \cdot q \cdot q \cdot q$

$2q^6$

28. $(-2u^2)(6u^6)$

$-2u \cdot u \cdot 6u u u u u u$

$-12u^8$

29. $(9w^2x^8)(w^6x^4)$

$9 ww xx xxxxxx \cdot 1 wwwwww xxxx$

$9w^8x^{12}$

5 in a row

$$\left(x^3\right)^4 = (x \cdot x \cdot x) \cdot (x \cdot x \cdot x) \cdot (x \cdot x \cdot x) \cdot (x \cdot x \cdot x)$$

$$1x^{12} = x^{12}$$

33. $\left(j^5 k^7\right)^4$　　　　　　**34.** $\left(n^3 p\right)^4$

$$j^{20} k^{28}$$

$$n^{12} p^4$$

Simplify $\left[(2^3)^2\right]^4$. $= 2^{24} = 16,777,216$

$\left[(2\cdot2\cdot2)(2\cdot2\cdot2)\right] \cdot \left[(2\cdot2\cdot2)(2\cdot2\cdot2)\right] \cdot \left[(2\cdot2\cdot2)(2\cdot2\cdot2)\right] \cdot \left[(2\cdot2\cdot2)(2\cdot2\cdot2)\right]$

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.

$$\frac{2}{14} a^3 b a^2$$

$$\frac{1}{7} a^5 b$$

Example 5 Simplify Expressions

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

Triangle puzzles

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

Order of operations...

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