Algebra 1 7.1

Multiply monomials using the properties of exponents

Simplify expressions using properties of exponents

monomial

constant

linear

nonlinear

exponent

base

whiteboards

$7x^2$ $6x - a$

$\frac{x^2}{y^3} \rightarrow$

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

21. 122

22. $3a^4$

23. $2c + 2$

Simplify each expression.

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

$qq \; 2qqqq$

$2q^6$

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

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

$-12u^8$

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

$9wwxxxxxxxxwwww$

$wwwxxxx$

$9w^8x^{12}$

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} $\quad$ $(g^6)^7 = g^{6 \cdot 7}$ or g^{42}

$(b \cdot b \cdot b)(b \cdot b \cdot b)(b \cdot b \cdot b)(b \cdot b \cdot b)(b \cdot b \cdot b)$

b^{15}

33. $(j^5k^7)^4$

$(j^5k^7)(\_\_)(\_\_)(\_\_)$

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

34. $(n^3p)^4$

$(n^3p)(n^3p)(n^3p)(n^3p)$

$n^{12}p^4$

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

2^{24}

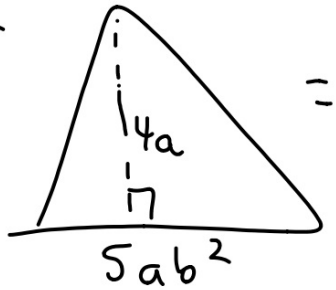
Triangle puzzles

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

$A = \frac{1}{2}bh = \frac{b \cdot h}{2}$

$= \frac{1}{2}(5ab^2)(4a)$

$= 10a^2b^2$



$A = \pi r^2$

$C = \pi d$

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.

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

$\frac{1}{2}a^2b$

$(x^2)^3$

Example 5 Simplify Expressions

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

$(3 \cdot x \cdot y \cdot y \cdot y \cdot y)(3 \cdot x \cdot y \cdot y \cdot y \cdot y)[(-2y)(-2y)][(-2y)(-2y)][(-2y)(-2y)]$

9 4 4 4

$576x^2y^{14}$

Order of operations...

GuidedPractice

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

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

$\frac{1}{8}$ 256

$32a^6b^{10}$

WB 7.1 prac. p. 86 (maybe 90)

1-20 all