

Warm Up

1/3

How much money would you have if you deposited \$10,000 in the bank for 10 years and got 4.8% interest added each year?



Because it is a constant PERCENT we are adding, this makes it exponential.

$$y = 10,000(1.048)^{10}$$
$$= \$15,981.33$$

Simplify the following:

$$\underline{3}x^4\underline{y}^3 \cdot \underline{5}x^5\underline{y}^{10}\underline{z}^{20}$$

$$15x^9y^{13}z^{20}$$

When we write monomials:

* The # is in front

* All our variables are in alphabetical order.

The background is a solid blue color with a repeating pattern of various question marks and symbols. The symbols are drawn in a hand-drawn, sketchy style with black outlines and some internal shading or patterns. The symbols include standard question marks, spiral shapes, and other abstract forms. The text "Questions from yesterday?" is centered in the upper half of the image in a white, bold, sans-serif font.

**Questions from
yesterday?**

Homework Questions?

NAME _____ DATE _____ PERIOD _____

8-1 Study Guide and Intervention

Multiplying Monomials

Multiply Monomials A **monomial** is a number, a variable, or a product of a number and one or more variables. An expression of the form x^n is called a **power** and represents the product you obtain when x is used as a factor n times. To multiply two powers that have the same base, add the exponents.

Product of Powers	For any number a and all integers m and n , $a^m \cdot a^n = a^{m+n}$.
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Example 1

Simplify $(3x^6)(5x^2)$.

$$\begin{aligned} (3x^6)(5x^2) &= (3)(5)(x^6 \cdot x^2) && \text{Associative Property} \\ &= (3 \cdot 5)(x^{6+2}) && \text{Product of Powers} \\ &= 15x^8 && \text{Simplify.} \end{aligned}$$

The product is $15x^8$.

Example 2

Simplify $(-4a^3b)(3a^2b^5)$.

$$\begin{aligned} (-4a^3b)(3a^2b^5) &= (-4)(3)(a^3 \cdot a^2)(b \cdot b^5) \\ &= -12(a^{3+2})(b^{1+5}) \\ &= -12a^5b^6 \end{aligned}$$

The product is $-12a^5b^6$.

Exercises

Simplify.

1. $y(y^5)$

2. $n^2 \cdot n^7$

3. $(-7x^2)(x^4)$

4. $x(x^2)(x^4)$

5. $m \cdot m^5$

6. $(-x^3)(-x^4)$

7. $(2a^2)(8a)$

8. $(rs)(rs^3)(s^2)$

9. $(x^2y)(4xy^3)$

$x \cdot x \cdot y \cdot 4 \cdot x \cdot y \cdot y \cdot y$

10. $\frac{1}{3}(2a^3b)(6b^3)$

11. $(-4x^3)(-5x^7)$

12. $(-3j^2k^4)(2jk^6)$

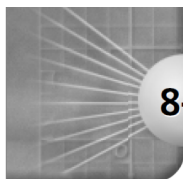
$4x^3y^4$

$\frac{1}{3}(6 \cdot 2) = \frac{1}{3} \cdot \frac{12}{1} = \frac{1 \cdot 12}{3 \cdot 1} = 4$

13. $(5a^2bc^3)\left(\frac{1}{5}abc^4\right)$

14. $(-5xy)(4x^2)(y^4)$

15. $(10x^3yz^2)(-2xy^5z)$

**8-1****Skills Practice*****Multiplying Monomials*****Simplify.**

7. $a^2(a^3)(a^6)$

8. $x(x^2)(x^7)$

9. $(y^2z)(yz^2)$

10. $(\ell^2k^2)(\ell^3k)$

11. $(e^2f^4)(e^2f^2)$

12. $(cd^2)(c^3d^2)$

13. $(2x^2)(3x^5)$

14. $(5a^7)(4a^2)$

15. $(4xy^3)(3x^3y^5)$

16. $(7a^5b^2)(a^2b^3)$

17. $(-5m^3)(3m^8)$

18. $(-2c^4d)(-4cd)$

When in doubt, expand it out!

$$-x = -1(x)$$

$$\underbrace{(-2c^4d)}_{\text{green}} \underbrace{(-4cd)}_{\text{blue}}$$

$$-2 \cdot c \cdot c \cdot c \cdot c \cdot d \cdot (-4) c \cdot d = 8c^5d^2$$

Expand it out!

What did we learn from yesterday?

$$x^5 \cdot x^3 = x^{5+3} = x^8$$

$$x^3 y^7 = \text{already as simple as we can get it}$$

$$3x^2 \cdot x^1 y^2 = 3x^3 y^2$$

Exponents and Multiplication

Simplify. Your answer should contain only positive exponents.

1) $4^2 \cdot 4^2$

2) $4 \cdot 4^2$

3) $3^2 \cdot 3^2$

4) $2 \cdot 2^2 \cdot 2^2$

5) $2n^4 \cdot 5n^4$

6) $6r \cdot 5r^2$

7) $2n^4 \cdot 6n^4$

8) $6k^2 \cdot k$

9) $5b^2 \cdot 8b$

10) $4x^2 \cdot 3x$

11) $6x \cdot 2x^2$

12) $6x \cdot 6x^3$

$$13) 7v^3 \cdot 10u^3v^5 \cdot 8uv^3$$

$$14) 9xy^2 \cdot 9x^5y^2$$

$$15) 6m^3n^3 \cdot 8m^2n^3$$

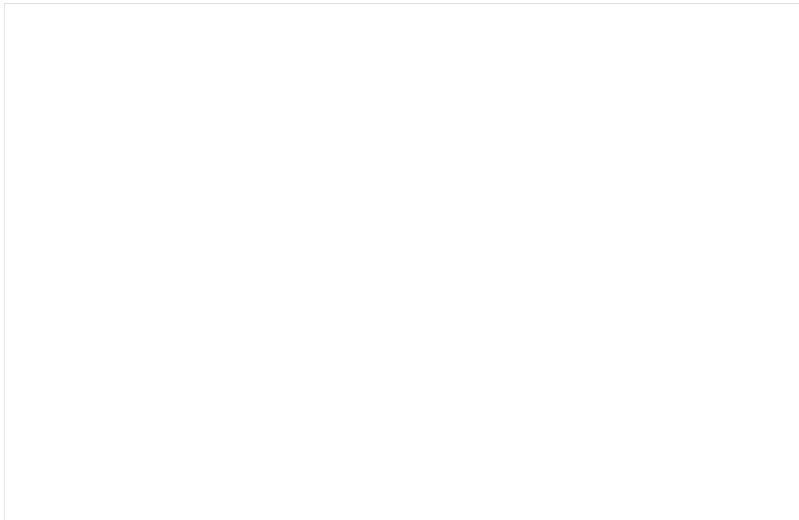
$$16) 6x^2 \cdot 6x^3y^4$$

$$17) 7u^2v^5 \cdot 9uv^3$$

$$18) uv \cdot 4uv^5$$

$$19) 10xy^3 \cdot 8x^5y^3$$

$$20) 3u^4v^5 \cdot 7u^2v^3$$



Homework

WHY ARE MR AND MRS. NUMBER SO HAPPY?

Find the simplest form for each expression below in the adjacent answer column. The letter of the exercise goes in the box that contains the number of the corresponding answer.

- | | | | |
|---|---|---|---|
| <p>Ⓔ $x^3 \cdot x^4$</p> <p>Ⓞ $3x^2 \cdot x$</p> <p>Ⓣ $2x^2 \cdot 3x$</p> <p>Ⓛ $x \cdot x^2 \cdot x^3$</p> <p>Ⓐ $x^4(-3x^2)$</p> <p>ⓗ $(-2x^2)(-2x)$</p> <p>Ⓔ $x(-x^4)(-x^4)$</p> | <p>Ⓟ $-3x^6$</p> <p>Ⓛ $3x^3$</p> <p>Ⓣ x^9</p> <p>Ⓣ x^7</p> <p>Ⓛ x^6</p> <p>Ⓣ $4x^3$</p> <p>Ⓣ $6x^3$</p> | <p>Ⓣ $(u^2v)(-6uv^2)$</p> <p>Ⓔ $v(uv^2)(u^3v)$</p> <p>Ⓔ $(4uv)(-u)(2u^4v)$</p> <p>Ⓐ $(-3u^2)(-u^2v^2)(2uv)$</p> <p>Ⓛ $(-u^2)(-6u^2v^3)(-u^3v^4)$</p> <p>Ⓛ $(-2u)(u^2v)(4u^3v^3)$</p> <p>Ⓣ $(\frac{1}{2}u^2v^3)(2uv^4)$</p> | <p>Ⓣ $-8u^6v^4$</p> <p>Ⓣ u^4v^4</p> <p>Ⓛ $-8u^6v^2$</p> <p>Ⓛ u^3v^7</p> <p>Ⓣ $6u^5v^3$</p> <p>Ⓛ $-6u^3v^3$</p> <p>Ⓣ $-6u^7v^7$</p> |
| <p>Ⓔ $(ab^2)(a^2b)$</p> <p>Ⓐ $(3ab)(2a^3b)$</p> <p>Ⓔ $ab(-4ab^3)$</p> <p>Ⓔ $(-a^4b)(-5a^2b^3)$</p> <p>Ⓣ $(-2a^3b)(2ab^3)$</p> <p>Ⓔ $(6a^2b^2)(-2ab^5)$</p> <p>Ⓞ $(-4ab^4)(-3ab^4)$</p> | <p>Ⓛ $5a^6b^4$</p> <p>Ⓣ a^3b^3</p> <p>Ⓣ $12a^2b^8$</p> <p>Ⓣ $-4a^2b^4$</p> <p>Ⓛ $-12a^3b^7$</p> <p>Ⓣ $-4a^4b^4$</p> <p>Ⓛ $6a^4b^2$</p> | <p>Ⓛ $(-b^2)(9a^2b^3)$</p> <p>Ⓣ $(3a^2c)(-3bc^2)$</p> <p>Ⓔ $c(-ab)(a^2b^2c^2)$</p> <p>Ⓞ $(-3a^2c)(-3b^2c)$</p> <p>Ⓣ $(-ab)(-b^2c^2)(-a^2b^2)$</p> <p>Ⓔ $(a^2bc^2)(b^2c^3)(9a)$</p> <p>Ⓔ $(3b^2)(\frac{1}{3}abc)(-c)$</p> | <p>Ⓣ $-a^3b^5c^2$</p> <p>Ⓣ $-ab^3c^2$</p> <p>Ⓣ $-a^3b^3c^3$</p> <p>Ⓛ $9a^3b^3c^5$</p> <p>Ⓣ $-9a^2bc^3$</p> <p>Ⓣ $-9a^2b^5$</p> <p>Ⓣ $9a^2b^2c^2$</p> |

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
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