Algebra Lesson 7-4A

Due Today: 7-3B p.341 #2-16 evens, #23-27 odds

Rewrite each expression using each base only once.

1. $2^6 \cdot 2^4$ 2^{10}
2. $5^{-13} \cdot 5^5 \cdot 2^2$ $\frac{2^2}{5^8}$
3. $10^{-6} \cdot 10^5 \cdot 10^1$ 1
4. $(0.99)^3 \cdot (0.99)^0$ $(0.99)^3$
5. $6^6 \cdot 6^{-2} \cdot 6^5$ 6^9
6. $(1.025)^2(1.025)^{-2}$ 1

Simplify each expression.

7. $c^{-2} \cdot c^7$ c^5
8. $3r \cdot r^4$ $3r^5$
9. $5t^{-2} \cdot 2t^{-5}$ $\frac{10}{t^7}$
10. $(7x^5)(8x)$ $56x^6$
11. $3x^2 \cdot x^2$ $3x^4$
12. $(-2.4n^4)(2n^{-1})$ $-4.8n^3$
13. $b^{-2} \cdot b^4 \cdot b$ b^3
14. $(-2m^3)(3.5m^{-3})$ -7
15. $(15a^3)(-3a)$ $-45a^4$
16. $(x^5y^2)(x^{-6}y)$ $\frac{y^3}{x}$
17. $(5x^5)(3y^6)(3x^2)$ $45x^7y^6$
18. $(4c^4)(ac^3)(3a^5c)$ $12a^6c^8$
19. $x^6 \cdot y^2 \cdot x^4$ $x^{10}y^2$
20. $a^6b^3 \cdot a^2b^{-2}$ a^8b
21. $-m^2 \cdot 4r^3 \cdot 12r^{-4} \cdot 5m$ $-\frac{240m^3}{r}$

Simplify each expression. Write each answer in scientific notation. 22–24. See left.

22. $(2 \times 10^3)(3 \times 10^2)$
23. $(2 \times 10^6)(3 \times 10^3)$
24. $(4 \times 10^6) \cdot 10^{-3}$
25. $(1 \times 10^3)(3.4 \times 10^{-8})$ 3.4×10^{-5}
26. $(8 \times 10^{-5})(7 \times 10^{-3})$ 5.6×10^{-7}
27. $(5 \times 10^7)(3 \times 10^{14})$ 1.5×10^{22}

Due Tomorrow: 7-4A p.348 #1-15 odds

9. $x^6 \cdot y^2 \cdot x^4$ **20.** $a^6b^3 \cdot a^2b^{-2}$ **21.** $-m^2 \cdot 4r^3 \cdot 12r^{-4} \cdot 5n$

implify each expression. Write each answer in scientific notation.

2. $(2 \times 10^3)(3 \times 10^2)$ **23.** $(2 \times 10^6)(3 \times 10^3)$ **24.** $(4 \times 10^6) \cdot 10^{-3}$

5. $(1 \times 10^3)(3.4 \times 10^{-8})$ **26.** $(8 \times 10^{-5})(7 \times 10^{-3})$ **27.** $(5 \times 10^7)(3 \times 10^{14})$

23. $6 \cdot 10^{9}$ -5

25. $3.4 \cdot 10$

27. $15 \cdot 10^{21}$

$1.5 \cdot 10^{1} \cdot 10^{21}$

$1.5 \cdot 10^{22}$

1) $-3x^{-7}y^{5} \cdot 5x^{4}y^{9}$ $-15x^{-3}y^{14}$

2) Write in scientific notation: 1,200,000

$1.2 \cdot 10^{6}$

$\rightarrow -15y^{14}$

x^{3}

Simplify

$x \cdot x \cdot x \cdot x = x^4$

$(x^3)(x^3)(x^3)(x^3)$

$= x^3 x^4 \qquad (x^3)^4$

$= x^7 \qquad x^{12}$

$(x^3)^4 = x^{3 \cdot 4} = x^{12}$

Property **Raising a Power to a Power**

For every nonzero number a and integers m and n, $(a^m)^n = a^{mn}$.

Examples $(5^4)^2 = 5^{4 \cdot 2} = 5^8$ $(x^2)^5 = x^{2 \cdot 5} = x^{10}$

Simplify $(x^3)^6$.

$$(x^3)^6 = x^{3 \cdot 6}$$

$$= x^{18}$$

$(3^6)^2 = 3^6 \cdot 3^6 = 3^{12}$

$(5^4)^3 = 5^4 \cdot 5^4 \cdot 5^4 = 5^{12}$

$(a^3)^2 = a^3 \cdot a^3 = a^6$

$$(2x^2y^{-2})^3 = 8x^6y^{-6}$$

$$= \frac{8x^6}{y}$$