

Lesson 4 Extra Practice
Powers of Monomials

Power to a Power = Multiply!
 $(4x)^3$

Simplify using the Laws of Exponents.

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|--------------------------------|--------------------------------|-------------------------------------------------|
| 1. $(2^3)^2$
2^6 | 2. $(4^3)^3$
4^9 | 3. $(6^2)^4$
6^8 |
| 4. $(a^4)^3$
a^{12} | 5. $(m^7)^8$
m^{56} | 6. $(k^5)^7$
k^{35} |
| 7. $[(3^2)^2]^3$
3^{12} | 8. $[(4^2)^2]^2$
4^8 | 9. $[(2^3)^2]^3$
2^{18} |
| 10. $(6z^4)^3$
$6^3 z^{12}$ | 11. $(8c^8)^3$
$8^3 c^{24}$ | 12. $(-3a^5b^{12})^5$
$(-3)^5 a^{25} b^{60}$ |

Simplify.

- | | | | |
|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-----------------------------------------------------------|
| 1. $(6t^5)^2$
$6^2 t^{10}$ | 2. $(4w^9)^4$
$4^4 w^{36}$ | 3. $(12k^6)^3$
$12^3 k^{18}$ | 4. $(15m^8)^3$
$15^3 m^{24}$ |
| 5. $(4d^3e^5)^7$
$4^7 d^{21} e^{35}$ | 6. $(-4r^6s^{15})^4$
$(-4)^4 r^{24} s^{60}$ | 7. $[(7^2)^2]^2$
7^8 | 8. $[(3^2)^2]^3$
3^{12} |
| ★ $(\frac{3}{5}a^6b^9)^2$
$(\frac{3}{5})^2 a^{12} b^{18}$ | ★ $(4x^2)^3(3x^6)^4$
$4^3 x^6 3^4 x^{24}$
$3^4 4^3 x^{30}$ | 11. $(0.6p^5)^3$
$0.6^3 p^{15}$ | ★ $(\frac{1}{5}w^5x^3)^2$
$(\frac{1}{5})^2 w^{10} x^6$ |

Lesson 5 Extra Practice
Negative Exponents

Negatives move!!

Write each expression using a positive exponent.

1. 5^{-3} $\frac{1}{5^3}$

2. 6^{-10} $\frac{1}{6^{10}}$

3. $(-2)^{-5}$ $\frac{1}{(-2)^5}$

4. $(-3)^{-2}$ $\frac{1}{(-3)^2}$

5. m^{-6} $\frac{1}{m^6}$

6. g^{-2} $\frac{1}{g^2}$

7. n^{-9} $\frac{1}{n^9}$

8. r^{-8} $\frac{1}{r^8}$

9. h^{-7} $\frac{1}{h^7}$

Simplify.

10. $3^{-2} \cdot 3^7$ $\frac{3^7}{3^2} = \boxed{3^5}$

11. $5^{-3} \cdot 5^5$ $\frac{5^5}{5^3} = \boxed{5^2}$

12. $x^{-5} \cdot x^{-3}$ $\frac{1}{x^5 x^3} = \boxed{\frac{1}{x^8}}$

13. $a^4 \cdot a^{-7}$ $\frac{a^4}{a^7} = \boxed{\frac{1}{a^3}}$

14. $a^{-2} b^3 \cdot a^{-5} b$ $\frac{b^3 b}{a^2 a^5} = \boxed{\frac{b^4}{a^7}}$

15. $x^2 y^{-2} \cdot x^{-5} y^3$ $\frac{x^2 y^3}{y^2 x^5} = \boxed{\frac{y}{x^3}}$

16. $\frac{7^{-2}}{7^{-6}}$ $\frac{7^6}{7^2} = \boxed{7^4}$

17. $\frac{x^{-4}}{x^5}$ $\frac{1}{x^5 x^4} = \boxed{\frac{1}{x^9}}$

18. $\frac{24a^3}{-6a^2}$ $\boxed{-4a}$

19. $\frac{18y^{-4}}{3y^{-10}}$ $\frac{6y^{10}}{y^4} = \boxed{6y^6}$

20. $\frac{4^2 x^5}{4^5 x^{-2}}$ $\frac{x^5 y^2}{4^3} = \boxed{\frac{x^7}{4^3}}$

21. $\frac{6^{-2} a^4}{6^{-3} a^{-2}}$ $\frac{6^3 a^4 a^2}{6^2} = \boxed{6a^6}$