

Practice 8-4

More Multiplication Properties of Exponents

Simplify each expression.

1. $(4a^5)^3$
2. $(2^{-3})^4$
3. $(m^{-3}n^4)^{-4}$
4. $(x^5)^2$
5. $2^5 \cdot (2^4)^2$
6. $(4x^4)^3(2xy^3)^2$
7. $x^4 \cdot (x^4)^3$
8. $(x^5y^3)^3(xy^5)^2$
9. $(5^2)^2$
10. $(a^4)^{-5} \cdot a^{13}$
11. $(3f^4g^{-3})^3(f^2g^{-2})^{-1}$
12. $x^3 \cdot (x^3)^5$
13. $(d^2)^{-4}$
14. $(a^3b^4)^{-2}(a^{-3}b^{-5})^{-4}$
15. $(x^2y)^4$
16. $(12b^{-2})^2$
17. $(m^{-5})^{-3}$
18. $(x^{-4})^5(x^3y^2)^5$
19. $(y^6)^{-3} \cdot y^{21}$
20. $n^6 \cdot (n^{-2})^5$
21. $(m^5)^{-3}(m^4n^5)^4$

Practice 8-5

Properties of Exponents

Division

Simplify each expression.

1. $\frac{c^{15}}{c^9}$
2. $\left(\frac{x^3y^{-2}}{z^{-5}}\right)^{-4}$
3. $\frac{x^7y^9z^3}{x^4y^7z^8}$
4. $\left(\frac{a^2}{b^3}\right)^5$
5. $\frac{3^7}{3^4}$
6. $\left(\frac{a^3}{b^2}\right)^4$
7. $\left(\frac{2}{3}\right)^{-2}$
8. $\left(\frac{p^{-3}q^{-2}}{q^{-3}r^5}\right)^4$
9. $\frac{a^6b^{-5}}{a^{-2}b^7}$
10. $\frac{7^{-4}}{7^{-7}}$
11. $\frac{a^7b^6}{a^5b}$
12. $\left(\frac{a^2b^{-4}}{b^2}\right)^5$
13. $\left(-\frac{3}{2^3}\right)^{-2}$
14. $\frac{z^7}{z^{-3}}$
15. $\left(\frac{5a^0b^4}{c^{-3}}\right)^2$
16. $\frac{x^4y^{-8}z^{-2}}{x^{-1}y^6z^{-10}}$
17. $\frac{m^6}{m^{10}}$
18. $\left(\frac{2^3m^4n^{-1}}{p^2}\right)^0$
19. $\left(\frac{s^{-4}}{t^{-1}}\right)^{-2}$
20. $\left(\frac{2a^3b^{-2}}{c^3}\right)^5$