

8

CHAPTER REVIEW

8.2 Apply Exponent Properties Involving Quotients

pp. 495–501

EXAMPLE

Simplify $\left(\frac{x^3}{y}\right)^4 \cdot \frac{2}{x^5}$.

$$\left(\frac{x^3}{y}\right)^4 \cdot \frac{2}{x^5} = \frac{(x^3)^4}{y^4} \cdot \frac{2}{x^5}$$

Power of a quotient property

$$= \frac{x^{12}}{y^4} \cdot \frac{2}{x^5}$$

Power of a power property

$$= \frac{2x^{12}}{y^4 x^5}$$

Multiply fractions.

$$= \frac{2x^7}{y^4}$$

Quotient of powers property

EXAMPLES
1, 2, and 3on pp. 495–496
for Exs. 16–24

EXERCISES

Simplify the expression.

16. $\frac{(-3)^7}{(-3)^3}$

17. $\frac{5^2 \cdot 5^4}{5^3}$

18. $\left(\frac{m}{n}\right)^3$

19. $\frac{17^{12}}{17^8}$

20. $\left(-\frac{1}{x}\right)^4$

21. $\left(\frac{7x^5}{y^2}\right)^2$

22. $\frac{1}{p^2} \cdot p^6$

23. $\frac{6}{7r^{10}} \cdot \left(\frac{r^5}{s}\right)^5$

24. **PER CAPITA INCOME** The order of magnitude of the population of Montana in 2003 was 10^6 people. The order of magnitude of the total personal income (in dollars) for Montana in 2003 was 10^{10} . What was the order of magnitude of the mean personal income in Montana in 2003?

8.3 Define and Use Zero and Negative Exponents

pp. 503–508

EXAMPLE

Evaluate $(2x^0y^{-5})^3$.

$$(2x^0y^{-5})^3 = 2^3 \cdot x^0 \cdot y^{-15}$$

Power of a power property

$$= 8 \cdot 1 \cdot y^{-15}$$

Definition of zero exponent

$$= \frac{8}{y^{15}}$$

Definition of negative exponents

EXAMPLES
1, 2, and 4on pp. 503–505
for Exs. 25–29

EXERCISES

Evaluate the expression.

25. 14^0

26. 3^{-4}

27. $\left(\frac{2}{3}\right)^{-3}$

28. $7^{-5} \cdot 7^5$

29. **UNITS OF MEASURE** Use the fact that 1 femtogram = 10^{-18} kilogram and 1 nanogram = 10^{-12} kilogram to complete the following statement:
1 nanogram = ? femtogram(s).