

10.4 Practice
For use after Lesson 10.4

Evaluate the expression.

1. 29^0 2. $12^{-1} = \frac{1}{12} = \left(\frac{1}{12}\right)$

(1)

3. $10^{-4} \cdot 10^{-6} = 10^{-4+(-6)} = 10^{-10} = \frac{1}{10^{10}} = 10,000,000,000$

4. $\frac{1}{3^{-3}} \cdot \frac{1}{3^5} = \frac{1}{3^2} = \left(\frac{1}{9}\right)$

Simplify. Write the expression using only positive exponents.

5. $19x^{-6} = \frac{19}{x^6}$

6. $\frac{14a^{-5}}{a^{-8}} = 14 \cdot a^{-5-(-8)} = 14a^3$

or... $\frac{14a^8}{a^5} = 14a^{8-5} = 14a^3$

7. $3t^6 \cdot 8t^{-6} = 24t^{6+(-6)} = 24t^0 = 24(1) = 24$

8. $\frac{12s^{-1} \cdot 4^{-2} \cdot r^3}{s^2 \cdot r^5}$

Two methods

Method 1: $\frac{12s^{-1} \cdot 4^{-2} \cdot r^3}{s^2 \cdot r^5} = \frac{12 \cdot r^3}{s^3 \cdot 16 \cdot r^5} = \frac{12 \cdot r^{-2}}{16s^3} = \frac{3}{4s^3r^2}$ (move neg exponents)

Method 2: $\frac{12s^{-1} \cdot 4^{-2} \cdot r^3}{s^2 \cdot r^5} = \frac{12 \cdot r^3}{s^3 \cdot 16 \cdot r^5} = \frac{12 \cdot r^{-2}}{16s^3} = \frac{3}{4s^3r^2}$ (Divide (subtract exponents))

9. The density of a proton is about $\frac{1.64 \times 10^{-24}}{3.7 \times 10^{-38}}$ grams per cubic centimeter. Simplify the expression.

Method 2:

$\frac{12s^{-1} \cdot 4^{-2} \cdot r^3}{s^2 \cdot r^5} \xrightarrow{\text{Divide 1st}}$

$12s^{-1-2} \cdot 4^{-2} \cdot r^{3-5}$

$12s^{-3} \cdot 4^{-2} \cdot r^{-2}$ (move these)

$\frac{12}{s^3 \cdot 4^2 \cdot r^2}$ (simplify)

$\frac{12}{16s^3r^2} = \left(\frac{3}{4s^3r^2}\right)$

$\frac{12 \cdot r^{-2}}{16s^3}$ (move to denominator)

$\frac{12}{16s^3r^2}$ (simplify)

$\left(\frac{3}{4s^3r^2}\right)$