

**Do you know HOW?**

Simplify each expression.

- $\frac{r^3 t^{-7}}{t^5}$
- $\left(\frac{a^3}{5m}\right)^{-4}$
- $c^3 v^9 c^{-1} c^0$
- $2y^{\frac{3}{4}} h^2 (2y^{\frac{1}{3}} h^{-4})^6$
- $(1.2)^5 (1.2)^{-2}$
- $(27a^{\frac{1}{2}})^{\frac{1}{3}}$
- Write the expression $(4x)^{\frac{1}{2}}$ in radical form.
- Write the expression $\sqrt[5]{a^4}$ as a power with a rational exponent.

Write a recursive definition for each geometric sequence.

- 10, 40, 160, 640, ...
- 25, 5, 1, 0.2, ...

Simplify each expression. Write each answer in scientific notation.

- $(6 \times 10^4)(4.8 \times 10^2)$
- $\frac{1.5 \times 10^7}{5 \times 10^{-2}}$

13. **Medicine** The human body normally produces about 2×10^6 red blood cells per second.
- Use scientific notation to express how many red blood cells your body produces in one day.
 - One pint of blood contains about 2.4×10^{12} red blood cells. How many seconds will it take your body to replace the red blood cells lost by donating one pint of blood? How many days?

Evaluate each function for $x = -1, 2,$ and 3 .

- $y = 3 \cdot 5^x$
- $f(x) = \frac{1}{2} \cdot 4^x$
- $f(x) = 4(0.95)^x$

Graph each function.

- $y = \frac{1}{2} \cdot 2^x$
- $y = 2 \cdot \left(\frac{1}{2}\right)^x$

19. **Banking** A customer deposits \$2000 in a savings account that pays 5.2% interest compounded quarterly. How much money will the customer have in the account after 2 yr? After 5 yr?
20. **Automobiles** Suppose a new car is worth \$30,000. You can use the function $y = 30,000(0.85)^x$ to estimate the car's value after x years.
- What is the decay factor? What does it mean?
 - Estimate the car's value after 1 yr.
 - Estimate the car's value after 4 yr.

Do you UNDERSTAND?

21. **Error Analysis** Find and correct the error in the work shown below.

$$\cancel{3^4 - 3^3 = 9^7}$$

22. **Reasoning** Show that $\sqrt[3]{x^9} = x^3$ by rewriting $\sqrt[3]{x^9}$ in exponential form.
23. **Writing** Explain when a function in the form $y = a \cdot b^x$ models exponential growth and when it models exponential decay.
24. Simplify the expression $\left(\frac{a^6}{a^4}\right)^2$ in two different ways. Justify each step.
25. **Reasoning** Explain how you can use the property for dividing powers with the same base to justify the definition of a zero exponent.