8 CHAPTER SUMMARY

BIG IDEAS

For Your Notebook

Big Idea 1

TEKS A.11.A

Applying Properties of Exponents to Simplify Expressions

You can use the properties of exponents to simplify expressions. For the properties listed below, a and b are real numbers, and m and n are integers.

Expression	Property
$a^m \cdot a^n = a^{m+n}$	**Product of powers property**
$(a^m)^n = a^{mn}$	**Power of power property**
$(ab)^m = a^m b^m$	**Power of product property**
$\frac{a^m}{a^n} = a^{m-n}, a \neq 0$	**Quotient of powers property**
$\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}, b \neq 0$	**Power of quotient property**

Big Idea 2

TEKS a.1

Working with Numbers in Scientific Notation

You can write numbers in scientific notation.

Number	Standard form	Scientific notation
Four billion	4,000,000,000	4×10^9
Thirty-two thousandths	0.032	3.2×10^{-2}

You can also compute with numbers in scientific notation. For example:

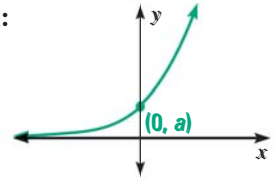
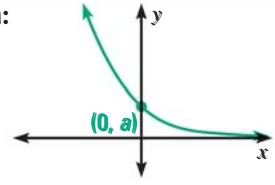
$$(4 \times 10^9) \times (3.2 \times 10^{-2}) = 12.8 \times 10^7 = 1.28 \times 10^8, \text{ or } 128{,}000{,}000$$

Big Idea 3

TEKS A.11.C

Writing and Graphing Exponential Functions

You can write and graph exponential growth and decay functions. You can also model real-world situations involving exponential growth and exponential decay.

Exponential growth	Exponential decay
Function: $y = ab^x$, $a > 0$ and $b > 1$	**Function** $y = ab^x$, $a > 0$ and $0 < b < 1$
Graph: 	**Graph:** 
Model: $y = a(1 + r)^t$	**Model:** $y = a(1 - r)^t$