

## Module 4 Topic B Lesson 5 Student Copy

### Exercises

1. Fill in the missing expressions for each row. For whole number and decimal bases, use a calculator to find the standard form of the number. For fraction bases, leave your answer as a fraction.

Exponential Form	Expanded Form	Standard Form
$3^2$	$3 \times 3$	9
	$2 \times 2 \times 2 \times 2 \times 2 \times 2$	
$4^5$		
	$\frac{3}{4} \times \frac{3}{4}$	
	$1.5 \times 1.5$	

2. Write five cubed in all three forms: exponential form, expanded form, and standard form.
3. Write fourteen and seven-tenths squared in all three forms.
4. One student thought two to the third power was equal to six. What mistake do you think he made, and how would you help him fix his mistake?

## Problem Sets for Homework

### Lesson Summary

**EXPONENTIAL NOTATION FOR WHOLE NUMBER EXPONENTS:** Let  $m$  be a nonzero whole number. For any number  $a$ , the expression  $a^m$  is the product of  $m$  factors of  $a$ , i.e.,

$$a^m = \underbrace{a \cdot a \cdot \cdots \cdot a}_{m \text{ times}}$$

The number  $a$  is called the *base*, and  $m$  is called the *exponent* or *power* of  $a$ .

When  $m$  is 1, “the product of one factor of  $a$ ” just means  $a$  (i.e.,  $a^1 = a$ ). Raising any nonzero number  $a$  to the power of 0 is defined to be 1 (i.e.,  $a^0 = 1$  for all  $a \neq 0$ ).

### Problem Set

1. Complete the table by filling in the blank cells. Use a calculator when needed.

Exponential Form	Expanded Form	Standard Form
$3^5$		
	$4 \times 4 \times 4$	
$(1.9)^2$		
$\left(\frac{1}{2}\right)^5$		

2. Why do whole numbers raised to an exponent get greater, while fractions raised to an exponent get smaller?

What is the advantage of using exponential notation?

What is the difference between  $4x$  and  $x^4$ ? Evaluate both of these expressions when  $x = 2$ .