Lesson 5: Exponents

Classwork

Opening Exercise

As you evaluate these expressions, pay attention to how you arrived at your answers.

$4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4$

$9 + 9 + 9 + 9 + 9$

$10 + 10 + 10 + 10 + 10$

Examples 1–5

Write each expression in exponential form.

1. $5 \times 5 \times 5 \times 5 \times 5 =$

2. $2 \times 2 \times 2 \times 2 =$

Write each expression in expanded form.

3. $8^3 =$

4. $10^6 =$

5. $g^3 =$

Go back to Examples 1–4, and use a calculator to evaluate the expressions.

What is the difference between $3g$ and g^3?

Examples 6–8

6. Write the expression in expanded form, and then evaluate.
   $(3.8)^4 =$

7. Write the expression in exponential form, and then evaluate.
   $2.1 \times 2.1 =$

8. Write the expression in exponential form, and then evaluate.
   $0.75 \times 0.75 \times 0.75 =$

The base number can also be a fraction. Convert the decimals to fractions in Examples 7 and 8 and evaluate. Leave your answer as a fraction. Remember how to multiply fractions!

Examples 9–10

9. Write the expression in exponential form, and then evaluate.

$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} =$

10. Write the expression in expanded form, and then evaluate.

$\left(\frac{2}{3}\right)^2 =$

Exercises

Fill in the chart, supplying the missing expression.

1. Fill in the missing expression 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	3×3	9
	$2 \times 2 \times 2 \times 2 \times 2 \times 2$	
4^5		
	$\frac{3}{4} \times \frac{3}{4}$	
	1.5×1.5	

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?