



Apply the order of operations and solve the expressions.

1  $5 \times 8 + 12 \div 3 + 9$

2  $10 \times 12 - 14 \div 2 + 15$

3  $(17 - 13) \times (14 - 6) - 22$

4  $(10 + 43 - 5) \div 6 + 5^2$

5  $(6 + 3)^2 + (9 - 10 \div 5)$

6  $(10 + 59 - 3^2) \div (24 - 4)$

7  $(3^2 - 1) \div (3 - 1)^2$

8  $(6 + 4)^2 + (11 + 10 \div 2)$

9  $2[3(8 - 2^2) - 6]$

10  $8 \times (3 - 1)^2 - 3 \times (7 - 4)^2$

### 3. Decimal Numbers and Rounding

REVIEW



- 1 Solve the addition and subtraction problems.

$$\begin{array}{r} 75.648 \\ 193 \\ 9.8012 \\ + 432.05 \\ \hline \end{array} \quad \begin{array}{r} 649 \\ - 78.59 \\ \hline \end{array}$$

- 2 Solve the addition and subtraction problems.

$$\begin{array}{r} 60.586 \\ 193 \\ 9.7039 \\ + 268.41 \\ \hline \end{array} \quad \begin{array}{r} 1385 \\ - 89.67 \\ \hline \end{array}$$

- 3 Multiply  $2.4 \times 9.37$ .

- 4 Multiply  $0.65 \times 74.8$ .

- 5 Solve  $91.75 \div 3.4$ .

- 6 Solve  $865.2 \div 41$ .

- 7 Round the following numbers.

round to tenths

- a. 72.649
- b. 64.15
- c. 123.06

round to hundredths

- d. 21.753
- e. 4.0051
- f. 1.049

round to thousandths

- g. 5.2394
- h. 0.2898
- i. 1.8995

- 8** Round the following numbers.

round to tenths

- a. 9.216
- b. 6.068
- c. 741.24

round to hundredths

- d. 0.0195
- e. 0.9373
- f. 1.696

round to thousandths

- g. 7.4319
- h. 5.5702
- i. 0.6969

- 9** Angela purchased 6 light bulbs at the hardware store. If her total bill before sales tax was \$22.75, what was the unit cost of a light bulb?

- 10** A group of 24 friends rent a hockey rink for 2 hours. The total cost is \$230. If they divide the cost evenly, what would each person pay?



## 2. Powers of Natural Numbers

EVALUATED



Skill Builder

- 1 Write the following product using Exponential Notation

$$(2)(2)(2)(2)(2) = ?$$

- 2 Write the following product using Exponential Notation

$$(3)(3)(3)(3) = ?$$

- 3 Express the following power as a product of factors.

$$2^3 = ?$$

- 4 Express the following power as a product of factors.

$$7^6 = ?$$

- 5 Find the value of the Natural Number  $x$  in the equation below.

$$5^x = 1$$

- 6 Find the value of the Natural Number  $x$  in the equation below.

$$x^3 = 27$$

- 7 Express the number 1000 as a power of 10.

- 8 Express the number 243 as a power of 3.

- 9 Calculate the power  $6^0 = ?$ .

- 10 Calculate the power  $2^5 = ?$ .

## 3. Powers of Integers

EVALUATED



- 1 Perform the following operation.

$$(-7)^2 = ?$$

- 2 Perform the following operation.

$$(-8)^2 = ?$$

- 3 Perform the following operation.

$$-4^3 = ?$$

- 4 Perform the following operation.

$$-10^4 = ?$$

- 5 Perform the following operation.

$$(-1)^{65} = ?$$

- 6 Perform the following operation.

$$(-1)^{100} = ?$$

- 7 Perform the following operation.

$$(-3)^4 = ?$$

- 8 Perform the following operation.

$$(-3)^5 = ?$$

- 9 Perform the following operation.

$$-3^0 = ?$$

- 10 Perform the following operation.

$$(-5)^0 = ?$$

## 4. An Introduction to Powers and Exponents

**EVALUATED**

- 1** Indicate the base and the exponent in the equation below.

$$2^4 = 16$$

- 2** Indicate the base and the exponent in the equation below.

$$a^b = c$$

- 3** Write the following exponential expression as an expanded multiplication.

$$2^6 = ?$$

- 4** Write the following exponential expression as an expanded multiplication.

$$x^5 = ?$$

- 5** Write the following multiplication with an exponent.

$$(4)(4)(4)(4)(4)(4) = ?$$

- 6** Write the following multiplication with an exponent.

$$(x)(x)(x)(x)(x)(x)(x) = ?$$

- 7** Determine the value of the following exponential expression.

$$5^3 = ?$$

- 8** Determine the value of the following exponential expression.

$$3^4 = ?$$

- 9** Determine the value of the following exponential expression.

$$8^0 = ?$$

- 10** Determine the value of the following exponential expression.

$$1^{10} = ?$$





## CLASSROOM INVESTIGATION: INVESTIGATING POWERS AND EXPONENTS

In this investigation students will solidify their understanding of powers and exponents and learn to avoid some of the common mistakes that students make when first beginning to work with powers.

### LEARNING GOALS

By completing this lesson you will:

- Be able to identify the components of a power.
- Express powers using repeated multiplication or standard form.
- Determine whether the base and exponent of a power are interchangeable.
- Determine the sum or difference of a given power.

### PART A: Repeated Multiplication and Standard Form

Given:  $3^4$

- 3 is the base
- 4 is the exponent
- the entire  $3^4$  is called a power

Powers can either be written as repeated multiplication or in standard form as illustrated below.

$$3^4 = 3 \times 3 \times 3 \times 3 \text{ using Repeated Multiplication}$$

$$3^4 = 81 \text{ in Standard Form}$$

When students are asked to evaluate (or calculate) a power it means to find the answer in standard form.

1. Complete the following table

Power	Repeated Multiplication	Standard Form
$2^6$		
$3^3$		
	$4 \times 4$	
$7^2$		
	$5 \times 5 \times 5$	
$3^5$		
	$6 \times 6$	
$1^6$		
	$2 \times 2 \times 2 \times 2 \times 2$	
$5^2$		