

## Unit 2 Study Guide

Skill	Description	Example
Evaluate a power with an integer base.	Write the power as repeated multiplication, then evaluate.	$(-2)^3 = (-2) \times (-2) \times (-2)$ $= -8$
Evaluate a power with an exponent 0.	A power with an integer base and an exponent 0 is equal to 1.	$8^0 = 1$
Use the order of operations to evaluate expressions containing exponents.	Evaluate what is inside the brackets. Evaluate powers. Multiply and divide, in order, from left to right. Add and subtract, in order, from left to right.	$(3^2 + 2) \times (-5)$ $= (9 + 2) \times (-5)$ $= (11) \times (-5)$ $= -55$
Apply the exponent law for a product of powers.	To multiply powers with the same base, add the exponents.	$4^3 \times 4^6 = 4^{3+6}$ $= 4^9$
Apply the exponent law for a quotient of powers.	To divide powers with the same base, subtract the exponents.	$2^7 \div 2^4 = \frac{2^7}{2^4}$ $= 2^{7-4}$ $= 2^3$
Apply the exponent law for a power of a power.	To raise a power to a power, multiply the exponents.	$(5^3)^2 = 5^3 \times 2$ $= 5^6$
Apply the exponent law for a power of a product.	Write the power of a product as a product of powers.	$(6 \times 3)^5 = 6^5 \times 3^5$
Apply the exponent law for a power of a quotient.	Write the power of a quotient as a quotient of powers.	$\left(\frac{3}{4}\right)^2 = \frac{3^2}{4^2}$

## Unit 2 Review

**2.1** 1. Give the base and exponent of each power.

a)  $6^2$  Base \_\_\_\_\_ Exponent \_\_\_\_\_

b)  $(-3)^5$  Base \_\_\_\_\_ Exponent \_\_\_\_\_

2. Write as a power.

a)  $4 \times 4 \times 4 = 4^{\quad}$

b)  $(-3)(-3)(-3)(-3)(-3) = \quad$

3. Write each power as repeated multiplication and in standard form.

a)  $(-2)^5 = \underline{\hspace{2cm}}$   
 $= \underline{\hspace{2cm}}$

b)  $10^4 = \underline{\hspace{2cm}}$   
 $= \underline{\hspace{2cm}}$

c) Six squared =  $\underline{\hspace{2cm}}$   
 $= \underline{\hspace{2cm}}$   
 $= \underline{\hspace{2cm}}$

d) Five cubed =  $\underline{\hspace{2cm}}$   
 $= \underline{\hspace{2cm}}$   
 $= \underline{\hspace{2cm}}$

**2.2** 4. Evaluate.

a)  $10^0 = \quad$

b)  $(-4)^0 = \quad$

c)  $8^1 = \quad$

d)  $-4^0 = \quad$

5. Write each number in standard form.

a)  $9 \times 10^3$   
 $= 9 \times \underline{\hspace{1cm}} \times \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}$   
 $= 9 \times \underline{\hspace{2cm}}$   
 $= \underline{\hspace{2cm}}$

$$\begin{aligned} \text{b) } & (1 \times 10^2) + (3 \times 10^1) + (5 \times 10^0) \\ & = (1 \times \underline{\quad}) + (3 \times \underline{\quad}) + (5 \times \underline{\quad}) \\ & = \underline{\hspace{2cm}} \\ & = \underline{\hspace{2cm}} \end{aligned}$$

$$\begin{aligned} \text{c) } & (2 \times 10^3) + (4 \times 10^2) + (1 \times 10^1) + (9 \times 10^0) \\ & = (2 \times \underline{\quad}) + (4 \times \underline{\quad}) + (1 \times \underline{\quad}) + (9 \times \underline{\quad}) \\ & = \underline{\hspace{2cm}} \\ & = \underline{\hspace{2cm}} \end{aligned}$$

$$\begin{aligned} \text{d) } & (5 \times 10^4) + (3 \times 10^2) + (7 \times 10^1) + (2 \times 10^0) \\ & = \underline{\hspace{2cm}} \\ & = \underline{\hspace{2cm}} \\ & = \underline{\hspace{2cm}} \end{aligned}$$

**2.3** 6. Evaluate.

$$\begin{aligned} \text{a) } & 3^2 + 3 \\ & = \underline{\quad} + 3 \\ & = \underline{\quad} + 3 \\ & = \underline{\quad} \end{aligned}$$

$$\begin{aligned} \text{b) } & [(-2) + 4]^3 \\ & = \underline{\quad}^3 \\ & = \underline{\quad} \\ & = \underline{\quad} \end{aligned}$$

$$\begin{aligned} \text{c) } & (20 + 5) \div 5^2 = \underline{\quad} \div 5^2 \\ & = \underline{\quad} \div \underline{\quad} \\ & = \underline{\quad} \end{aligned}$$

$$\begin{aligned} \text{d) } & (8^2 - 4) \div (6^2 - 6) \\ & = (\underline{\quad} - 4) \div (\underline{\quad} - 6) \\ & = \underline{\quad} \div \underline{\quad} \\ & = \underline{\quad} \end{aligned}$$

## 7. Evaluate.

$$\begin{aligned} \text{a) } & 5 \times 3^2 = 5 \times \underline{\quad} \\ & = \underline{\quad} \end{aligned}$$

$$\begin{aligned} \text{b) } & 10 \times (3^2 + 5^0) = 10 \times \underline{\quad} \\ & = 10 \times \underline{\quad} \\ & = \underline{\quad} \end{aligned}$$

$$\begin{aligned} \text{c) } & (-2)^3 + (-3)(4) = \underline{\quad} + \underline{\quad} \\ & = \underline{\quad} \end{aligned}$$

$$\begin{aligned} \text{d) } & (-3) + 4^0 \times (-3) = (-3) + \underline{\quad} \times (-3) \\ & = (-3) + \underline{\quad} \\ & = \underline{\quad} \end{aligned}$$

**2.4 8.** Write as a power.

$$\text{a) } 6^3 \times 6^7 = 6(\underline{\quad} + \underline{\quad}) \\ = 6\underline{\quad}$$

$$\text{b) } (-4)^2 \times (-4)^3 = (-4)\underline{\quad} \\ = (-4)\underline{\quad}$$

$$\text{c) } (-2)^5 \times (-2)^4 = (-2)\underline{\quad} \\ = (-2)\underline{\quad}$$

$$\text{d) } 10^7 \times 10 = \underline{\quad} \\ = \underline{\quad}$$

**9.** Write as a power.

$$\text{a) } 5^7 \div 5^3 = 5(\underline{\quad} - \underline{\quad}) \\ = 5\underline{\quad}$$

$$\text{b) } \frac{10^5}{10^3} = \underline{\quad} \\ = \underline{\quad}$$

$$\text{c) } (-6)^8 \div (-6)^2 = \underline{\quad} \\ = \underline{\quad}$$

$$\text{d) } \frac{5^{10}}{5^6} = \underline{\quad} \\ = \underline{\quad}$$

$$\text{e) } 8^3 \div 8 = \underline{\quad} \\ = \underline{\quad}$$

$$\text{f) } \frac{(-3)^4}{(-3)^0} = \underline{\quad} \\ = \underline{\quad}$$

**2.5 10.** Write as a power.

$$\text{a) } (5^3)^4 = 5\underline{\quad} \times \dots \times \dots \\ = 5\underline{\quad}$$

$$\text{b) } [(-3)^2]^6 = (-3)\underline{\quad} \times \dots \\ = (-3)\underline{\quad}$$

$$\text{c) } (8^2)^4 = \underline{\quad} \\ = \underline{\quad}$$

$$\text{d) } [(-5)^5]^4 = \underline{\quad} \\ = \underline{\quad}$$

**11.** Write as a product or quotient of powers.

$$\text{a) } (3 \times 5)^2 = 3\underline{\quad} \times 5\underline{\quad}$$

$$\text{b) } (2 \times 10)^5 = \underline{\quad}$$

$$\text{c) } [(-4) \times (-5)]^3 = \underline{\quad}$$

$$\text{d) } \left(\frac{4}{3}\right)^5 = \underline{\quad}$$

$$\text{e) } (12 \div 10)^4 = 12\underline{\quad} \div 10\underline{\quad}$$

$$\text{f) } [(-7) \div (-9)]^6 = \underline{\quad}$$