

Chapter 2 Practice Test: Powers and Exponent Laws

Student Self-Assessment

Please fill in the following after completing the practice test and looking at the correct solutions.

Learning Outcomes		Practice Questions	I get all of it	I get it, but made some errors	I get only some of it	I don't get it at all
A1	Demonstrate an understanding of powers with integral bases.	#1-3				
A4	Explain and apply the order of operations with and without technology.	#4-5				
A2	Demonstrate an understanding of operations on powers with integral bases and whole number exponents.	#6-10				

What do you need to work on? What is your plan to ensure you will be successful come test day?

1. (a) Use repeated multiplication to show the difference between 2^3 and 3^2 .

(b) Complete the following table:

Power	Base	Exponent	Repeated Multiplication	Standard Form
2^5				
$(-3)^3$				
			$-(2 \times 2 \times 2 \times 2)$	
	-1	3		

2. A student was told that -2^3 and $(-2)^3$ were the same. Is this correct? Use **repeated multiplication** and **standard form** to support your answer.

3. (a) **Evaluate** the following powers.

-10^0	4^0

(b) Write 100 000 000 000 as a **power of ten**.

(c) Write 3 700 000 000 000 in **scientific notation**.

(d) Write 4.157×10^7 in **standard form**.

4. **Evaluate** the following expressions. Show all work.

(a) $[(4 - 1)^3 \times (3 + 3)^5]^0$

(b) $4^2 \times 4 + 2^2 \times 2^3$

(c) $(6 - 8)^5 \div (-4)$

(d) $[(-14) - 6]^2 + 11$

5. Both Alyssa and Karen evaluated the following expression. Alyssa's answer was 10 and Karen's answer was -8 . Who is **correct** if one of the answers is right? Show your work.

$$(-3^2 \times 2 - 2) \div (-2)$$

6. (a) Using **repeated multiplication**, show that $2^3 \times 2^4 = 2^7$

(b) Using **repeated multiplication**, show that $(-3)^6 \div (-3)^4 = (-3)^2$

(c) Using **repeated multiplication**, show that $(4^2)^3 = 4^6$

(d) Using **repeated multiplication**, show that $(2 \times 5)^2 = 2^2 \times 5^2$

7. **Simplify** the following expressions using exponent laws, but **do not evaluate**.

(a) $(-2)^{52} \times (-2)^3 =$

(e) $(2^8)^4 =$

(b) $10^{14} \times 10^2 =$

(f) $[(-3)^2]^6 =$

(c) $5^7 \div 5^3 =$

(g) $(12 \div 10)^4 =$

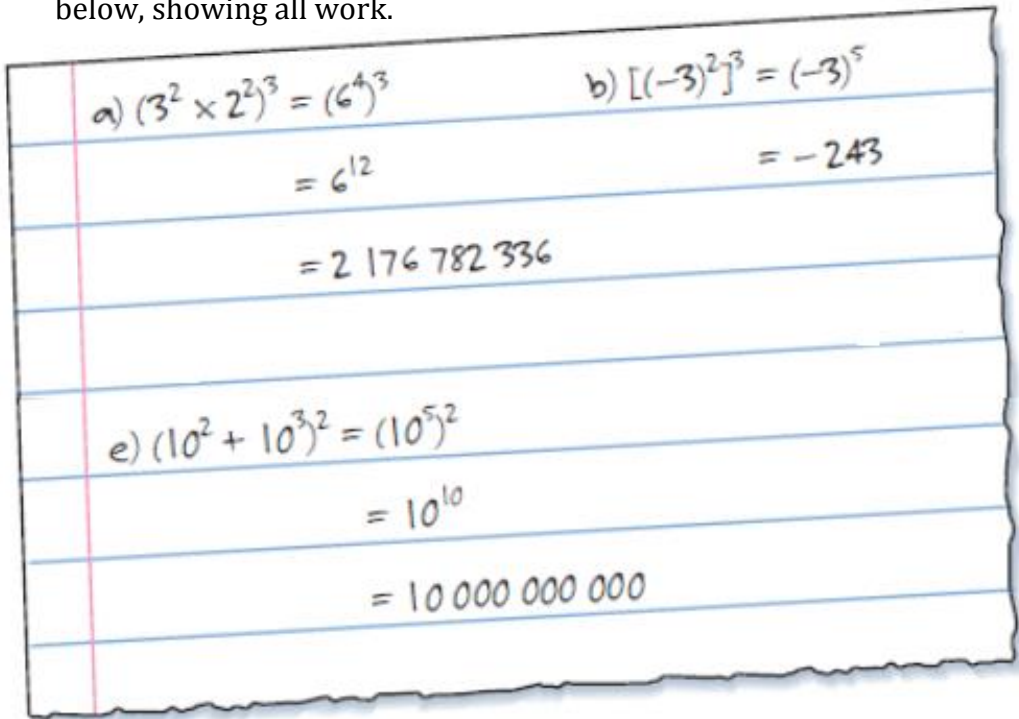
(d) $\frac{5^{19}}{5^8} =$

(h) $\left(\frac{1}{2}\right)^2 =$

8. Is the value of $\frac{[(-21)^5]^6}{[(-21)^2]^3}$ **positive or negative**? Explain why.

9. **Simplify**, then **evaluate** $[(-3)^2]^5 \div [(-3)^3]^3 - [(-3)^3]^0$. Show all work.

10. The student solutions below are full of errors. Write the **correct solutions** in the table below, showing all work.



Question a)	Question b)	Question e)

Answers to Chapter 2 Practice Test

1. (a) $2^3 = (2)(2)(2)$ but $3^2 = (3)(3)$
 (b)

Power	Base	Exponent	Repeated Mult.	Standard Form
	2	5	$(2)(2)(2)(2)(2)$	32
	-3	3	$(-3)(-3)(-3)$	-27
-2^4	2	4		-16
$(-1)^3$			$(-1)(-1)(-1)$	-1

2. $-2^3 = -(2)(2)(2) = -8$ and $(-2)^3 = (-2)(-2)(-2) = -8$ so they evaluate to the same thing, but their repeated multiplication is different.

3. (a)

-1	1
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- (b) 10^{11}
 (c) 3.7×10^{12}
 (d) 41 570 000

4. (a) 1
 (b) 96
 (c) 8
 (d) 411

5. Alyssa is correct.

6. (a) $(2)(2)(2) \times (2)(2)(2)(2) = 2^7$

(b) $\frac{\cancel{(-3)}\cancel{(-3)}\cancel{(-3)}\cancel{(-3)}\cancel{(-3)}\cancel{(-3)}}{\cancel{(-3)}\cancel{(-3)}\cancel{(-3)}\cancel{(-3)}} = (-3)^2$

(c) $(4^2)(4^2)(4^2) = (4)(4)(4)(4)(4)(4) = 4^6$

(d) $(2 \times 5)(2 \times 5) = (2)(2)(5)(5) = 2^2 \times 5^2$

7. (a) $(-2)^{55}$
 (b) 10^{16}
 (c) 5^4
 (d) 5^{11}
 (e) 2^{32}
 (f) $(-3)^{12}$
 (g) $12^4 \div 10^4$
 (h) $\frac{1^2}{2^2}$

8. It simplifies to $(-21)^{24}$, which is positive since there are an even number of negative numbers being multiplied.

9. -4

10. (a) 46656 (b) 729 (e) 1 210 000