Negative Exponents and Negative Bases

Name: _____	Date: _____	Score: _____ / 18

Quick Review and Helpful Hints

A negative *exponent* means take the reciprocal: $x^{-n} = \frac{1}{x^n}$. A negative *base* needs care: an *even* exponent gives a positive result, an *odd* exponent gives a negative result. Watch the parentheses: $(-2)^4$ has base -2, but -2^4 means $-(2^4)$.

▷ **Example:** Evaluate $(-2)^{-3}$. **Work:** First handle the negative exponent: $(-2)^{-3} = \frac{1}{(-2)^3}$. Now $(-2)^3 = -8$ (odd power of a negative base is negative). So the value is $\frac{1}{-8} = -\frac{1}{8}$.

★ **Answer:** $-\frac{1}{8}$

Practice Problems

Evaluate each expression. Watch the parentheses carefully.

1. $(-3)^2$ _____
2. $(-3)^3$ _____
3. -2^4 _____
4. $(-2)^4$ _____
5. $(-5)^{-2}$ _____
6. $(-2)^{-3}$ _____
7. $(-1)^7$ _____
8. $(-4)^2$ _____
9. -3^2 _____
10. $(-10)^{-2}$ _____
11. $(-1)^{10}$ _____
12. $(-2)^5$ _____
13. $(-6)^{-1}$ _____
14. $(-3)^{-2}$ _____

Word Problems

15. A temperature change is modeled by $(-2)^3$ degrees. What is its value? _____
16. In a repeating pattern, a term equals $(-1)^{20}$. What is its value? _____
17. A value in a formula is $(-5)^{-2}$. Write it as a fraction. _____
18. A spreadsheet compares two formulas, -4^2 and $(-4)^2$, for a sign-error check. Find both values and explain why they differ. _____

Answer Keys

1. 9
2. -27
3. -16
4. 16
5. $\frac{1}{25}$
6. $-\frac{1}{8}$
7. -1
8. 16
9. -9
10. $\frac{1}{100}$
11. 1
12. -32
13. $-\frac{1}{6}$
14. $\frac{1}{9}$
15. -8
16. 1
17. $\frac{1}{25}$
18. -16 and 16

Step-by-Step Explanations

1. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is An even power makes a negative base positive: $(-3)^2 = (-3)(-3) = 9$. So the final answer is 9.

2. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is An odd power keeps the result negative: $(-3)^3 = -27$. So the final answer is -27.

3. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is No parentheses, so the power touches only the 2: $-2^4 = -(16) = -16$. So the final answer is -16.

4. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The parentheses include the sign, and an even power is positive: $(-2)^4 = 16$. Notice how this differs from -2^4! So the final answer is 16.

5. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Flip for the negative exponent, then square (even power stays positive): $(-5)^{-2} = \frac{1}{(-5)^2} = \frac{1}{25}$. So the final answer is $\frac{1}{25}$.

6. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Flip, then cube (odd power stays negative): $(-2)^{-3} = \frac{1}{(-2)^3} = \frac{1}{-8} = -\frac{1}{8}$. So the final answer is $-\frac{1}{8}$.

7. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is An odd power of -1 stays -1. So the final answer is -1.

8. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is An even power of a negative base is positive, so $(-4)^2 = 16$. So the final answer is 16.

9. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Without parentheses this means $-(3^2) = -9$ – the sign is not squared. So the final answer is -9.

10. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Flip and square: $(-10)^{-2} = \frac{1}{(-10)^2} = \frac{1}{100}$. So the final answer is $\frac{1}{100}$.

11. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is An even power of -1 is 1. So the final answer is 1.

12. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is An odd power of a negative base is negative: $(-2)^5 = -32$. So the final answer is -32.

13. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The reciprocal of -6 is $-\frac{1}{6}$, so $(-6)^{-1} = -\frac{1}{6}$. So the final answer is $-\frac{1}{6}$.

14. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Flip and square (even power, positive): $(-3)^{-2} = \frac{1}{(-3)^2} = \frac{1}{9}$. So the final answer is $\frac{1}{9}$.

15. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is An odd power of a negative base is negative, so $(-2)^3 = -8$ degrees. So the final answer is -8.

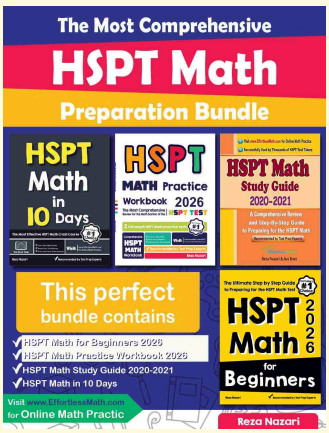
16. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is An even power of -1 is 1, so this pattern term equals 1. So the final answer is 1.

17. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Flip, then square: $(-5)^{-2} = \frac{1}{(-5)^2} = \frac{1}{25}$. So the final answer is $\frac{1}{25}$.

18. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Without parentheses, $-4^2 = -(16) = -16$; with them, $(-4)^2 = 16$. The parentheses decide whether the sign is squared. So the final answer is -16 and 16.

Keep Building HSPT Math Skills

Recommended Effortless Math resources



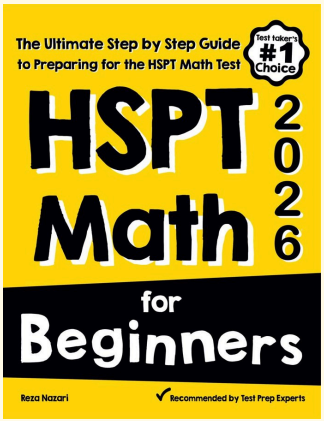
The Most Comprehensive HSPT Math Preparation Bundle

Use the complete HSPT Math resource for review, worked examples, extra practice, and test-style questions after each worksheet.

Scan Me

Download Instantly

STUDENT FAVORITE - HSPT Math for Beginners



HSPT Math for Beginners 2026

Step-by-step lessons, topic practice, and full review support for students who want a calm path through HSPT Math preparation.

A strong companion for self-study, tutoring, homework, and targeted review.

PDF Edition

Scan Me

Download Instantly

For more HSPT Math prep, visit EffortlessMath.com/HSPT