

Zero and Negative Exponents

Name: _____

Date: _____

Score: _____ / 18

Quick Review and Helpful Hints

Any *nonzero* base raised to the 0 power equals 1: $x^0 = 1$. A *negative* exponent means take the reciprocal: $x^{-n} = \frac{1}{x^n}$, and $\frac{1}{x^{-n}} = x^n$. To finish a problem, rewrite everything with positive exponents and then simplify.

▷ **Example:** Rewrite 2^{-3} with a positive exponent and evaluate it. **Work:** A negative exponent means take the reciprocal: $2^{-3} = \frac{1}{2^3}$. Then $2^3 = 8$, so the value is $\frac{1}{8}$. ★ **Answer:** $\frac{1}{8}$

◆ Practice Problems

Evaluate or rewrite each expression with positive exponents.

1. Evaluate 7^0 _____

8. Simplify $\frac{1}{x^{-2}}$ _____

2. Evaluate 3^{-2} _____

9. Evaluate $4^0 + 3^0$ _____

3. Evaluate 5^{-1} _____

10. Evaluate 6^{-2} _____

4. Evaluate $(-4)^0$ _____

11. Rewrite $3x^{-2}$ with positive exponents _____

5. Evaluate 2^{-4} _____

12. Evaluate 2^{-3} _____

6. Rewrite x^{-5} with a positive exponent _____

13. Evaluate $\left(\frac{1}{2}\right)^{-2}$ _____

7. Evaluate 10^{-3} _____

14. Evaluate 9^{-1} _____

◆ Word Problems

15. A scientist writes a measurement as 10^{-2} meters. Express this as a fraction. _____

16. A calculator displays 5^0 as a result. What number is this? _____

17. The thickness of a sheet is 2^{-4} inch. Write this thickness as a fraction. _____

18. A science formula has the denominator 4^{-1} in the expression $\frac{1}{4^{-1}}$. What is the simplified value? _____



Answer Keys

1. $\boxed{1}$

2. $\boxed{\frac{1}{9}}$

3. $\boxed{\frac{1}{5}}$

4. $\boxed{1}$

5. $\boxed{\frac{1}{16}}$

6. $\boxed{\frac{1}{x^5}}$

7. $\boxed{\frac{1}{1000}}$

8. $\boxed{x^2}$

9. $\boxed{2}$

10. $\boxed{\frac{1}{36}}$

11. $\boxed{\frac{3}{x^2}}$

12. $\boxed{\frac{1}{8}}$

13. $\boxed{4}$

14. $\boxed{\frac{1}{9}}$

15. $\boxed{\frac{1}{100}}$

16. $\boxed{1}$

17. $\boxed{\frac{1}{16}}$

18. $\boxed{4}$

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 Any nonzero number raised to the zero power equals 1 – a handy rule to memorize, so $7^0 = 1$. So the final answer is 1.

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 A negative exponent means take the reciprocal: $3^{-2} = \frac{1}{3^2} = \frac{1}{9}$.

So the final answer is $\frac{1}{9}$.

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 5^{-1} is simply the reciprocal of 5, namely $\frac{1}{5}$. So the final answer is $\frac{1}{5}$.

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 zero power gives 1 even with a negative base, so $(-4)^0 = 1$. So the final answer is 1.

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 and raise: $2^{-4} = \frac{1}{2^4} = \frac{1}{16}$. So the final answer is $\frac{1}{16}$.

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 Move the factor to the denominator to make the exponent positive: $x^{-5} = \frac{1}{x^5}$. So the final answer is $\frac{1}{x^5}$.

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 $10^{-3} = \frac{1}{10^3} = \frac{1}{1000}$ – powers of ten make this quick. So the final answer is $\frac{1}{1000}$.

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 A negative exponent in the denominator jumps up top: $\frac{1}{x^{-2}} = x^2$. So the final answer is x^2 .

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 Each term is 1 because of the zero power, so $1 + 1 = 2$. So the final answer is 2.

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: $6^{-2} = \frac{1}{6^2} = \frac{1}{36}$. So the final answer is $\frac{1}{36}$.

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 Only the x has the negative exponent, so it moves down while the 3 stays: $3x^{-2} = \frac{3}{x^2}$.

So the final answer is $\frac{3}{x^2}$.

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 $2^{-3} = \frac{1}{2^3} = \frac{1}{8}$. So the final answer is $\frac{1}{8}$.

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 A negative exponent flips the fraction first: $(\frac{1}{2})^{-2} = (\frac{2}{1})^2 = 4$. So the final answer is 4.

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 9^{-1} is the reciprocal of 9, namely $\frac{1}{9}$. 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 $10^{-2} = \frac{1}{10^2} = \frac{1}{100}$ meter. So the final answer is $\frac{1}{100}$.

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 Any nonzero base to the zero power is 1, so the display reads 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 $2^{-4} = \frac{1}{2^4} = \frac{1}{16}$ inch. So the final answer is $\frac{1}{16}$.

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 The negative exponent in the denominator moves up top: $\frac{1}{4^{-1}} = 4$. So the final answer is 4.



Keep Building GRE Math Skills

Recommended Effortless Math resources

GRE Math for Beginners 2026



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



Scan Me
Download Instantly

STUDENT FAVORITE - 10 Full Length GRE Math Practice Tests



10 Full Length GRE Math Practice Tests

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

PDF Edition



Scan Me
Download Instantly

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

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