

Name:

Date:

Period:

Evaluating Negative Exponents

- A] Make sure the problem is a fraction to begin with.
(You may just have to put it over a "1" to make it a fraction)
- B] Change the location of the negative exponent and make the exponent positive.
(be careful to just move the term with the negative exponent)
- C] Do the math if you can (reduce or multiply out when possible).

The rule is $a^{-n} = \frac{1}{a^n}$

This is what I mean about location...

Top ←
Bottom ← Either top or bottom

Examples:

1. $4^{-3} = \frac{4^{-3}}{1} = \frac{1}{4^3} = \frac{1}{64}$

Make into a fraction

Move to bottom & exponent becomes positive

2. $\frac{5^{-4}}{5^{-2}} = \frac{5^2}{5^4} = \frac{1}{5^2} = \frac{1}{25}$

Move to bottom

Move to top

5 is a base. Do not divide!

3. $\left(\frac{4}{3}\right)^{-2} = \left(\frac{3}{4}\right)^2 = \frac{9}{16}$

Flip ENTIRE fraction and make exponent positive

4. $\frac{8p^{-5}}{2p^3} = \frac{8}{2p^3p^5} = \frac{4}{1p^8}$

Move ONLY the p^{-5} to bottom

Don't change anything

5. $4(10)^{-2} = \frac{4(10)^{-2}}{1} = \frac{4}{10^2} = \frac{4}{100} = \frac{1}{25}$

Make into a fraction

Leave 4 on top

Move to bottom & exponent becomes positive

Let's try a few:

1. 3^{-3}

2. r^{-4}

3. $2s^{-5}$

4. $\left(\frac{2}{5}\right)^{-3}$

5. $\frac{x^{-3}}{x^{-5}}$

6. $3x^{-3}$

7. $\frac{2m^{-2}}{8m^6}$

8. $\frac{6k^4}{7k^{-4}}$

Write each expression using a positive exponent.

1. 4^{-5}

2. 5^{-7}

3. m^{-9}

4. s^{-6}

5. f^{-3}

6. $(-2)^{-6}$

7. $(-4)^{-3}$

8. w^{-12}

Evaluate each expression

9. $(-5)^{-5}$

10. 3^{-2}

11. 8^{-3}

12. $(-9)^{-4}$

Write each fraction as an expression using a negative exponent. You do not need to evaluate it.

13. $\frac{1}{12^3}$

14. $\frac{1}{81}$

15. $\frac{1}{t^6}$

16. $\frac{1}{8^8}$

Simplify. Express using positive exponents.

17. $2^{-6} \bullet 2^3$

18. $s^{-5} \bullet s^7$

19. $\frac{m^8}{m^{-4}}$

20. $\frac{10^8}{10^9}$

21. $y^{-3} \bullet y^3$

22. $s^5 \bullet s^{-7}$

23. $\frac{x^6}{x^{-3}}$

24. $\frac{6^{-4}}{6^8}$

25. $\frac{3^{-5}}{3^{-3}}$

26. $\frac{e^{-3}}{e^{-2}}$

27. $\frac{n^{-6}}{n^4}$

28. $\frac{j^{-2}}{j^{-2}}$

29. Will these two problems give you the same answer? Explain why or why not. -2^{-4} and $(-2)^{-4}$