

# 9.3 Negative and Zero Exponents

ALGEBRA

Write your questions here!

$2^1 =$

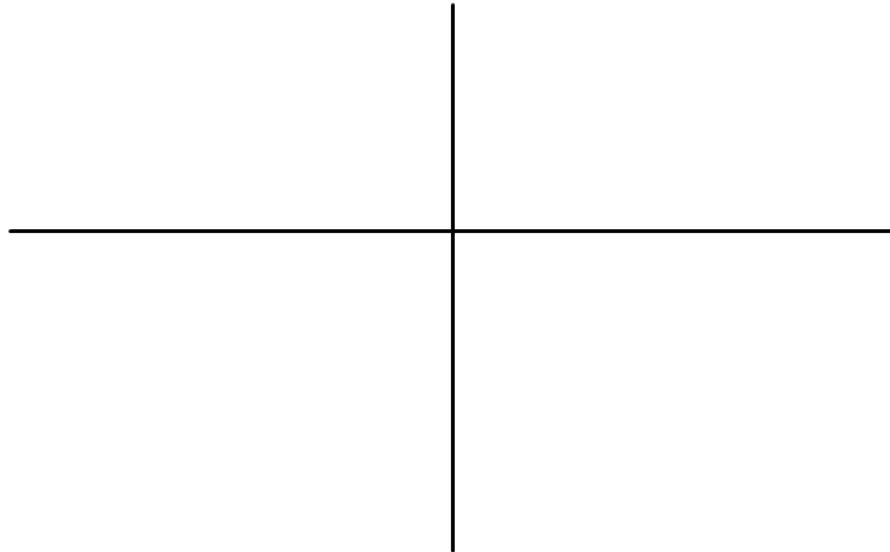
$2^2 =$

$2^3 =$

$2^4 =$

$2^5 =$

**Rewrite using positive exponents!**



**Simplify. Then rewrite using positive exponents!**

$2x^2y^{-3}z^2$

$\frac{1}{4}a^{-2}b^5c^{-3}$

$(3x^{-3}y^0)^2$

$2m^4n \cdot 3m^{-3}n^{-5}$

**Simplify. Then rewrite using positive exponents!**

$$\frac{4x^2y^{-3}}{2x^5y^2z^4}$$

**BRING THE PAIN!**

$$\frac{(2xy^4)^3(3x^{-3}y^2)}{4x^{-3}y^0}$$

**Summarize your notes:**

## 9.3 PRACTICE

**Simplify. Your answer should contain only positive exponents.**

1. $4^{-3}$	2. $7^{-3}$	3. $(-2)^{-6}$	4. $2^0$
5. $(-4)^0$	6. $\left(\frac{3}{4}\right)^0$	7. $(2^{-3})^5$	8. $(3^{-2})^2$
9. $3^2 \cdot 5^0$	10. $4^{-5} \cdot 4^{-2}$	11. $\frac{3^4}{3^7}$	12. $\frac{7^{-4}}{7^5}$

**Error Analysis**

13. Describe and correct the error in evaluating  $\frac{5^4}{5^{-7}}$

$$\frac{5^4}{5^{-7}} = 5^{-3} = \frac{1}{5^3}$$



**Rewrite using only positive exponents.**

14. $x^{-4}$	15. $2y^{-3}$	16. $4^{-3}g^2$	17. $x^2y^{-3}z$
18. $5m^{-3}n^{-4}$	19. $\frac{2}{3}a^4b^{-5}c^{-2}$	20. $4m^{-2}n$	21. $2^{-3}x^0y^4$

**Simplify. Your answer should contain only positive exponents.**

22. $5x^3y^{-4} \cdot 4xy^2$	23. $2a^{-5}b^7 \cdot 7a^0b^{-3}$	24. $(3x^{-5})^2$	25. $(4d^2h^{-5})^3$
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26. $\frac{12x^8y^{-5}}{4x^{10}y^2}$	27. $\frac{r^6t}{4r^0t^4}$	28. $\frac{3x^8y^{-5} \cdot 2xy^2}{5x^8y^{-5}}$	29. $\frac{12x^8y^{-5}}{(2x^4y)^2}$
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30.

★ **MULTIPLE CHOICE** Which expression is equivalent to  $(-4 \cdot 2^0 \cdot 3)^{-2}$ ?

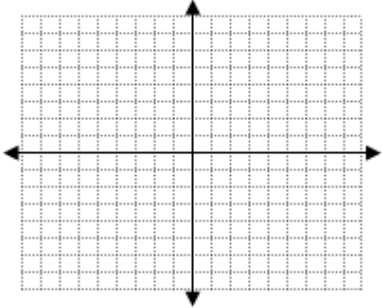
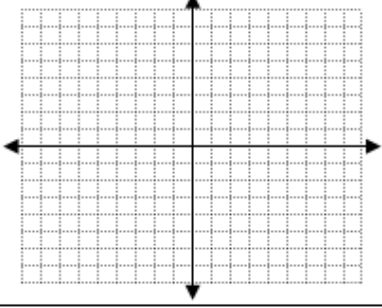
- Ⓐ -12      Ⓑ  $-\frac{1}{144}$       Ⓒ 0      Ⓓ  $\frac{1}{144}$

**Fill in the missing exponents**

31. $4^? = \frac{1}{4^5}$	32. $\frac{7^{-3}}{7^{-5}} = 7^?$	33. $(2x^2y^4)^{-3} = \frac{1x^6}{8y^{12}}$	34. $(a^3b^{-2})^? = \frac{a^{12}}{b^8}$
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**Simplify. Your answer should contain only positive exponents.**

32.  $\left(\frac{(2xy)(3xy^4)^3}{4x^{-2}y^5}\right)^0$

SKILLZ REVIEW		
GRAPH	EVALUATE	SOLVE
1. $y = -2x - 3$ 	2. $b^2 - 4a$ , when $a = -3$ and $b = -2$	3. $2(2x - 5) = 10$
4. $x = -2$ 	5. $2dt - t$ , when $d = 2$ and $t = 5$	6. $4(x - 5) = 2(3x - 5)$

## 9.3 APPLICATION

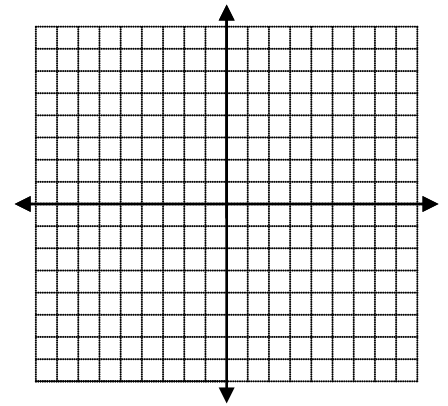
Simplify the expression. Write your answer using only positive exponents.

1.  $x^9x^{-4} =$

2.  $(4x^{-2})^3 =$

3. Given  $y = 8x^{-2}$ , fill in the table and plot the points.  
(HINT: Rewrite using positive exponents!)

$x$	$y$
-3	
-2	
-1	
1	
2	
3	



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4. Given  $f(x) = 2^x$ , fill in the table and plot the points. (decimals are okay for some!)

$x$	$f(x)$
-2	
-1	
0	
1	
2	
3	

