

NEGATIVE EXPONENTS

NEGATIVE EXPONENT RULE:

$$x^{-a} = \frac{1}{x^a}$$

Simplify each of the following. Your answer should contain positive exponents only!		
1. $x^{-5} = \frac{1}{x^5}$	2. $3m^{-2} = \frac{3}{m^2}$	3. $-7a^{-4}b^3 = \frac{-7b^3}{a^4}$
4. $6x^8 \cdot -3x^{-7} = -18x$	5. $(3x^3)^{-2} = 3^{-2}x^{-6} = \frac{1}{3^2x^6} = \frac{1}{9x^6}$	6. $(5y^2)^{-2} = 5^{-2}y^{-4} = \frac{1}{5^2y^4} = \frac{1}{25y^4}$
7. $(-8x^5y^{-4})^{-2} = (-8)^{-2}x^{-10}y^8 = \frac{y^8}{(-8)^2x^{10}} = \frac{y^8}{64x^{10}}$	8. $(a^{-5}b^8c^{-12})(a^7b^{-3}c^7) = a^2b^5c^{-5} = \frac{a^2b^5}{c^5}$	9. $(x^2y^3)^{-2} \cdot (x^5y^4)^{-3} = x^{-4}y^{-6} \cdot x^{-15}y^{-12} = x^{-19}y^{-18} = \frac{1}{x^{19}y^{18}}$
10. $(4x^3y^6)^{-2} + (2x^2y^4)^{-3} = 4^{-2}x^{-6}y^{-12} + 2^{-3}x^{-6}y^{-12} = \frac{1}{16x^6y^{12}} + \frac{1}{8x^6y^{12}} = \frac{1}{16x^6y^{12}} + \frac{2}{16x^6y^{12}} = \frac{3}{16x^6y^{12}}$	11. $\frac{h^4}{h^6} = h^{-2} = \frac{1}{h^2}$	12. $\frac{k^{-2}}{k^7} = k^{-2-7} = k^{-9} = \frac{1}{k^9}$
13. $\frac{14w^4}{7w^{-2}} = 2w^{4-(-2)} = 2w^6$	14. $\frac{-24x^5}{3x^{-2}} = -8x^7$	15. $\frac{b^7c}{b^2c^5} = c^{-4} = \frac{1}{c^4}$
16. $\frac{x^4y^{-3}}{x^2y^2} = x^2y^{-5} = \frac{x^2}{y^5}$	17. $\frac{32a^5b^{-3}}{8a^{-2}b^6} = 4a^7b^{-9} = \frac{4a^7}{b^9}$	18. $\frac{36x^{-4}y^8}{12y^7} = 3x^{-4}y = \frac{3y}{x^4}$
19. $\frac{15ab^5c^8}{18ab^3c^9} = \frac{5b^2}{6c}$	20. $\frac{-4pq^5r^3}{8p^2q^2r^{10}} = \frac{-1q^3}{2p^1r^7}$	21. $\frac{-9r^2s^6t^4}{54r^5s^2t^8} = \frac{-1s^4}{6r^3t^4}$

<p>22. $\frac{(6a^3)(5a^9)}{-12a^{14}} = \frac{30a^{12}}{-12a^{14}} = \frac{5}{-2a^2}$</p>	<p>23. $\frac{(3xy)^2(2x^4y^3)}{6x^8y} = \frac{9x^2y^2 \cdot 2x^4y^3}{6x^8y}$ $\frac{18x^6y^5}{6x^8y} = \frac{3y^4}{x^2}$</p>
<p>24. $\frac{(-6x^4y^6)^2}{(-4x^{-3}y^5)^3} = \frac{36x^8y^{12}}{-64x^{-9}y^{15}}$ $= \frac{9x^{17}}{-16y^3}$</p>	<p>25. $\frac{(6bc^3)(3b^5c^2)}{(5b^5c^2)(2b^3c^6)} = \frac{18b^6c^5}{10b^8c^8}$ $= \frac{9}{5b^2c^3}$</p>



Simplify the following completely:

$$\left(\frac{(2x^4y^{-3})^{-2} \cdot (2x^{-1}y^{-2})^4}{2x^{-7}y^{-3}} \right)^3$$

$$\left(\frac{2^{-2}x^{-8}y^6 \cdot 2^4x^{-4}y^{-8}}{2x^{-7}y^{-3}} \right)^3$$

$$\frac{2^{-6}x^{-24}y^{18} \cdot 2^{12}x^{-12}y^{-24}}{2^3x^{-21}y^{-9}}$$

$$\frac{2^6x^{-36}y^{-6}}{2^3x^{-21}y^{-9}} = 2^3x^{-15}y^3 = \frac{8y^3}{x^{15}}$$