

Index Laws

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Indices are multiples of a number. Other names for indices include exponents, powers or orders. An index is written as a small number on the upper-right side of a base number.		
1	Any number to the power of ZERO equals 1. $x^a = 1$	$5^0 = 1$ $15^0 = 1$ $150^0 = 1$
2	Add indices when multiplying numbers with indices $x^a \times x^b = x^{a+b}$	$x^2 \times x^2 = x^4$ $x^5 \times x^3 = x^8$ $x^{10} \times x^{11} = x^{21}$
3	Subtract indices when dividing numbers with indices $x^a \div x^b = x^{a-b}$	$x^6 \div x^2 = x^4$ $x^9 \div x^4 = x^5$ $x^{25} \div x^{11} = x^{14}$
4	Multiply indices when numbers with indices are in brackets and are powered $(x^a)^b = x^{a \times b}$	$(x^3)^2 = x^6$ $(x^5)^3 = x^{15}$ $(x^{10})^6 = x^{60}$
5	Base numbers with negative indices become denominators $x^{-a} = \frac{1}{x^a}$	$x^{-2} = \frac{1}{x^2}$

Instructions: Answer the questions below using the index laws.

1	$\frac{(4x^3x^2)^2}{-8x^3x}$	=
2	$\frac{20x^4 \times -4x^5x^2}{-5x^7}$	=



3	$-8x^5x^6 \times 6x^9 \div 2x$	=
4	$\frac{-12x^{11} \times 4x^3x^{-1}}{6x^3}$	=
5	$3(x^7)^5 \times 21(x^9)^2$	=
6	$\frac{(6x^{-8})^2 \div 12x^9x^4}{x^3x^{11}}$	=
7	$-48x^{-9}x^{-4} \div 6x^{-3} \times 2x^{15}$	=
8	$(-12x^7)^2 \times 2(x^3x^5)^7$	=
9	$-15(x^{12})^5 \times -4(x^{-9})^{11}$	=
10	$\frac{x^6 \times (4x^{-7})^2}{-2x^{-17}}$	=
11	$\frac{2(x^{-2})^6 \div x^{-7}x^8}{x^{-5}x^{-10}}$	=
12	$121(x^{15})^2 \div 11(x^3x^3)^6$	=
13	$\frac{9(x^3 \times x^9)^5}{6x^5x^{-1}}$	=
14	$\frac{(-5x^6x^5)^2}{-x^{-7}x^{-3}}$	=
15	$\frac{7(3x^{10})^2 \times x^{-5}x^5}{2x^{-7}x^{11}}$	=
16	$-14(x^{-3})^5 \times 3(x^9)^2$	=
17	$\frac{9x^7x \times -3(x^7)^{-4}}{-x^4x^{12}}$	=
18	$\frac{36(x^7)^5 \times 2x^{-9}}{-(x^4)^4}$	=
19	$\frac{-63(x^3)^{-5}}{9x^8 \times x^3x^{-14}}$	=
20	$\frac{(9x^3)^2 \times x^7x^2}{(x^{-8})^2 \times x^{-10}x^{-6}}$	=
21	$\frac{-132(x^4)^4}{11x^2x^{-3} \times x^3x^7}$	=



22	$\frac{-48(x^7)^5}{4x^6 \times -3x^5x^{-5}}$	=
23	$\frac{84(x^5)^5x^{-3}}{6x^{-3}x \times 2x^{-5}}$	=
24	$\frac{-72x^{12}x^{-4}x^7}{6x^{-9}x^5x^{-3}}$	=
25	$\frac{13(x^8)^6 \times x^{-7}x^{-2}}{-x^{-4}x \div x^{-12}}$	=
26	$\frac{6(2x^{-3})^2 \times 5x^{-12}}{x \div x^{-12}}$	=
27	$-(-8x^7)^2 \div 4(x^3)^3x$	=
28	$\frac{110(x^8)^{-12}}{-10x^{-4}x^{13}}$	=
29	$\frac{90x^{-17} \div x^4x^6}{(3x^{-7})^2}$	=
30	$\frac{(-12x^7)^2 \times -x^4}{-6x^2x^{-2}}$	=
31	$\frac{-(10x^{-9})^2 \times 2x^8x^8}{(5x^{-3})^2 \times x^{-10}x^{10}}$	=
32	$(-7x^{14})^2 \div 7x^2(x^{-9})^6$	=
33	$\frac{4x^{15}x^{-9} \times 5x(x^2)^7}{-2(x^{11})^{11}}$	=
34	$\frac{(4x^2)^2 \div (-2x^{-11}x)^2}{x^3x^{10}}$	=
35	$\frac{-(12x^{-15})^2 \div 2x^{-9}x^3}{(x^4x^{-8})^5 \times x^{-20}}$	=
36	$-3(-11x^{13})^2 \div x(x^{-1})^5x^2$	=
37	$\frac{75x^{11}x^{-16} \times 2(x^{-3})^9}{-(5x^9)^2}$	=
38	$\frac{55x^{-13}x^5 \div 11x^{-4}x^2}{-(x^3x^{-7})^2}$	=
39	$\frac{64x^{-11} \div x^5x^{-5}}{16x^4 \div 2x^{-3}}$	=
40	$\frac{7(3x^{11})^2 \div -x^4x^8x}{(x^{14})^2 \div x^{-13}}$	=

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Instructions: Answer the questions below using the index laws.

1	$-6x^3x^{-3} \times 5x^{11} \div 2x^2$	=
2	$(9x^{11})^2 \times 2(x^7x^{-2})^7$	=



3	$\frac{-8x^{12}x \times 5x^3x^{-5}}{10x^{10}} =$
4	$\frac{(7x^{13}x^{-6})^2}{-x^2x^5} =$
5	$54(x^{-5})^4 \div 6(x^8x^{-4})^6 =$
6	$\frac{-(4x^{11})^2 \div 8x^{-13}x^2}{x^3x^{11}} =$
7	$3(x^{-5})^9 \times -13(x^6)^{-8} =$
8	$\frac{-96(x^8)^8}{4x^5 \times 3x^{-2}} =$
9	$\frac{-9(x^3)^{-2} \times 4x^{11}x^2}{x^3x \div x^{20}} =$
10	$\frac{54x^{12}x \div x^{-4}x^4}{-(3x^{15})^2} =$
11	$60(-x^8x)^9 \div 12x(x^{-13})^2 =$
12	$\frac{42x^{14}x^{-5} \div 6x^3x^6}{-(x^7x^{-7})^2} =$
13	$\frac{-(7x^4)^2 \times 2x^7x^{-3}}{x(x^6)^{-3} \times x^4} =$
14	$\frac{3(x^6)^7 \div (x^{12}x^{-4})^2}{-x^{-4}x^{-1}} =$
15	$\frac{121x^9x^5 \div x^{-2}x^2}{-11(x^5x^6)^3} =$
16	$\frac{-84x^{10}x^{-1}x^7}{-7x^{12}x^{-4}x^4} =$
17	$\frac{(6x^{12})^2}{-3x^{11} \times -3x^3x^2} =$
18	$\frac{-(10x^8)^2 \div 4x^7x^7}{5(x^3x^{-2})^5 \times x^{-1}} =$
19	$\frac{56x^{10} \div -7x^5x^5}{(2x^7)^2} =$
20	$2(5x^{-6})^2 \div 10x(x^{-6})^6x^{11} =$
21	$\frac{-60(x^6)^7}{-6x^{-7}x^4} =$



22	$\frac{-64x^{-12}x^4x^{12}}{8x^{13}x^2x^2}$	=
23	$\frac{-(9x^5)^2 \times x^4x^{-4}}{(3x^{-3})^2 \times x^7x^{-3}}$	=
24	$\frac{5x^9x^8 \times -4(x^4)^4}{-(2x^8)^2}$	=
25	$\frac{35(x^{14})^2 \times x^{-12}x}{7x \div x^{-5}}$	=
26	$\frac{45x^5x^{-9}x^4}{(3x^{-4})^2}$	=
27	$\frac{-10(-x^{-3})^6 \times 4x^{15}}{-8x^{-7}x \div 2x^{-12}}$	=
28	$(-6x^{12})^2 \div 4x^3(x^3)^5$	=
29	$132(x^{-1}x^{13})^2 \div 12x(x^{-7})^5$	=
30	$\frac{144x^{-7}x^8x^9}{12x^4x^6x^{-11}}$	=
31	$\frac{12x^{-7}x^{-14} \times -4(x^{-3})^5}{-8(x^9)^2}$	=
32	$2(-12x^{13})^2 \div -x^3(x^{-8})^5$	=
33	$\frac{7(-2x^{-3})^2 \times 2x^{10}}{x^6x^5 \div x^{-9}}$	=
34	$108(x^7)^{-6} \div 9x^6(x^5)^{-5}$	=
35	$\frac{-63x^{14}x^6 \div 7x^{-4}x^{-9}}{-(x^4x^{-4})^2}$	=
36	$\frac{(7x^{-15})^2 \div -x^3x^{12}x^{-7}}{-7(x^{14})^2 \div x^{-13}}$	=
37	$\frac{-2(9x^{-9})^2 \times x^5x^{-9}}{(x^{-4})^{-4} \times 2x^{15}x^{-3}}$	=
38	$\frac{60x^{10}x^{-14} \times (x^4)^8}{-72(x^6)^{-4}}$	=
39	$\frac{121x^8x^7 \div 11x^5x^{-6}}{-132(x^7x^6)^2}$	=
40	$\frac{3(3x^{-12})^2 \div -x^{13}x^{-1}x}{-(x^{12})^{-4} \times 45x^{30}}$	=