

Laws of Exponents.

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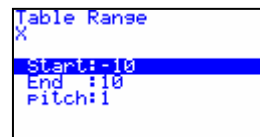
Select Table icon (press 7) from the main menu or by using the arrow keys to highlight and then press EXE.



Introduction: Learning how to apply the laws of algebraic combining such as to multiply, and divide monomials and to raise a monomial to a power.

Using the Table icon features of the graphic calculator the student can match the way that they have combined the monomials to see if they have combined correctly by comparing their entered compacted (or expanded) monomial with the original. By checking the numerically illustrated results displayed in the columns are the same will be confirmation that they have applied the correct use of the algebraic techniques and consolidating these mathematical concepts.

Set the **TABLE**, **F6** to an appropriate set of x values to tabulate.



Example 1: Simplify $6x^3 \times 5x^4$
Enter in Y1 the expression given above.



In Y2, Y3 etc enter in what you believe to be the simplified equivalent.



Scroll through the **TABLE**, **F6** to view the Y column that matches the 'possibles' that you have entered with Y1.

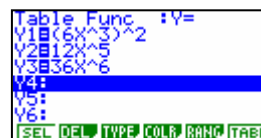
X	Y1	Y2	Y3
-10	-3E8	-1.1E8	-3E8
-9	-1.4E8	-5.2E7	-1.4E8
-8	-6.2E7	-2.3E7	-6.2E7
-7	-2.4E7	-9E6	-2.4E7
-10			-10

X	Y1	Y2	Y3
0	0	0	0
1	30	11	30
2	3840	1408	3840
3	65610	24057	65610
-10			-10

X	Y1	Y2	Y3
7	2.47E7	9.05E6	2.47E7
8	6.29E7	2.3E7	6.29E7
9	1.43E8	5.2E7	1.43E8
10	3E8	1.1E8	3E8
-10			-10

When multiplying monomials, you add the powers and multiply the coefficients.

Example 2: Simplify $(6x^3)^2$



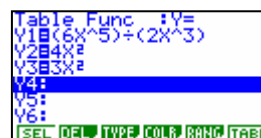
X	Y1	Y2	Y3
-10	3.6E7	-1.2E6	3.6E7
-9	1.91E7	-7E5	1.91E7
-8	9.43E6	-3.9E5	9.43E6
-7	4.23E6	-2E5	4.23E6
-10			-10

X	Y1	Y2	Y3
-5	562500	-37500	562500
-4	147456	-12288	147456
-3	26244	-2916	26244
-2	2304	-384	2304
-10			-10

X	Y1	Y2	Y3
4	147456	12288	147456
5	562500	37500	562500
6	1.67E6	93312	1.67E6
7	4.23E6	201604	4.23E6
-10			-10

When raising a monomial to a power, you raise the coefficient to the power outside the bracket and multiply both of the powers.

Example 3: Simplify $6x^5 \div 2x^3$



X	Y1	Y2	Y3
-10	300	400	300
-9	243	324	243
-8	192	256	192
-7	147	196	147
-10			-10

X	Y1	Y2	Y3
-1	3	4	3
0	ERROR	0	0
1	3	4	3
2	12	16	12
-10			-10

X	Y1	Y2	Y3
7	147	196	147
8	192	256	192
9	243	324	243
10	300	400	300
-10			-10

When dividing two monomials, the numerator coefficient is divided by the denominator coefficient and the denominator power is subtracted from the numerator power. [N.B. dividing by 0.]