

Balancing Exponents

NAME _____

Go to the Activities section of the Illuminations web site (<http://illuminations.nctm.org>), and access the *Pan Balance – Numbers* activity.

Enter the following expressions in the left pan. Using the order of operations, and *one step at a time*, enter an equivalent expression in the right pan. When the pans balance, you are correct, and the equivalent expressions are shown under Balanced Equations. Record the expressions below.

For example, put $3^2 + 2 \times 5$ in the left pan. Then, enter $9 + 2 \times 5$ in the right pan:

$$\begin{aligned} 3^2 + 2 \times 5 &= 9 + 2 \times 5 \\ &= 9 + 10 \\ &= 19 \end{aligned}$$

If the pans don't balance, make changes until they do. The computer is checking your work, so continue until it is correct. Be sure to record every step that the computer records.

Note that the computer uses ^ to represent an exponent, so 3^2 is entered as 3^2. The computer also uses * for multiplication and / for division. Press Reset Balance when you start each new problem.

1. $(9 - 6)^2 - 1$

8. $7^2 + 3 \times (2 + 3)$

2. $9 - (6^2 - 1)$

9. $(5 \times 5) \div 5^2$

3. $7 - 12 \div 3 - 3$

10. $2^5 + 4 / 2$

4. $3 + 2.5 \div 0.5$

11. $9^2 \div (2 + 1)$

5. $7^2 - 7 \times 2$

12. $15 + 5 \times 2^2$

6. $15 \div 3 \times 2$

13. $(6 - 2)^2 \div 4$

7. $3^4 - 4^3$

14. $5^2 - 2 \times 3$