

3.3 Order of Operations

Explore Order of Operations With Powers

The following notes provide guidelines to help you adapt the Explore Order of Operations With Powers section from *MathLinks 9*.

- Use the Warm Up to review the order of operations without exponents.
- Post the rules for the order of operations.
- Have students work in pairs or small groups as they work through this exercise.
- Review the meaning of *coefficient*, *expression*, and *exponential form*. Give an example of each.
- Do #3 as a teacher-led activity, making sure each part is completed before moving on to the next part.
- Remind students that 3×5 can also be written as $3(5)$.

Examples

- Review the meaning of *product* and *evaluate*.
- Show several examples of how to evaluate expressions with negative powers. Some examples to discuss and review include
$$\begin{array}{lll} (-2)^3 = -8 & -2^3 = -8 & -(-2)^3 = +8 \\ (-2)^4 = +16 & -2^4 = -16 & -(-2)^4 = -16 \end{array}$$
- Since calculators key sequences vary, encourage students to record the proper key sequence for their calculator to use as a reference and reminder.

Communicate the Ideas, Practise, and Apply

- Students may benefit from working in pairs to complete #9.
- Provide students who need additional practice with **BLM 3–5 Section 3.3 Extra Practice**.

Math Link

- Remind students that the height and radius *must* be the same measurement for the cube and cylinder. Show an example on the board, using a diagram of each.
- Review whole numbers and exponential form.

Common Errors

- Some students may enter key sequences incorrectly in their calculators.
- R_x** Check students' calculators to ensure they can perform the order of operations. Remind students to enter all brackets. Review when the negative key should be entered for each type of calculator.