



Evaluating Negative Bases with Integer Exponents

Video Notes

[Video Link](#)

Evaluating Negative Bases with Integer Exponents

Background Information:

- Multiplication of Integers

Evaluate x^2 when:

$$x = 3$$

$$3^2 = 3 \cdot 3 = \boxed{9}$$

$$(3)^2 = 9$$

* Brackets/parentheses are not necessary here, but are totally fine.

$$x = -2$$

$$(-2)^2 = -2 \cdot -2 = \underline{(-2)} \underline{(-2)} = \boxed{4}$$

You must put brackets/parentheses

around a negative value that is raised to any power!

Different from

$$\begin{array}{l} -2^2 \\ \downarrow \\ -(2)^2 \\ \downarrow \\ \boxed{-4} \end{array}$$

Evaluate x^3 when:

$$x = 3$$

optional \rightarrow

$$3^3 = 3 \cdot 3 \cdot 3 = \boxed{27}$$
$$(3)^3$$

$$x = -2$$

$$\underline{(-2)}^3 = \underline{-2} \cdot \underline{-2} \cdot \underline{-2} = \underline{4} \cdot \underline{-2} = \boxed{-8}$$

~~$-2^3 = -8$~~
↑
wrong notation

Evaluate x^4 when:

$$x = 3$$

optional $3^4 = \underline{3 \cdot 3 \cdot 3 \cdot 3} = 81$
 \downarrow
 $(3)^4 = \underline{9 \cdot 9}$

$$x = -2 \quad (-2)^4 = \frac{-2 \cdot -2 \cdot -2 \cdot -2}{4 \cdot -2 \cdot -2} = \boxed{16}$$
$$\frac{-8 \cdot -2}{-8 \cdot -2}$$

$$\frac{-2 \cdot -2 \cdot -2 \cdot -2}{4 \cdot 4} = 16$$

Evaluate x^5 when:

$$x = 3$$

optional $3^5 = \underline{3 \cdot 3 \cdot 3 \cdot 3 \cdot 3} = \boxed{243}$
 \downarrow
 $(3)^5 = \underline{9 \cdot 3 \cdot 3 \cdot 3}$
 $\underline{27 \cdot 3 \cdot 3}$
 $\underline{81 \cdot 3}$
 243

$$x = -2$$

$$(-2)^5 = \frac{-2 \cdot -2 \cdot -2 \cdot -2 \cdot -2}{4 \cdot -2 \cdot -2 \cdot -2} = \boxed{-32}$$
$$\frac{-8 \cdot -2 \cdot -2}{16 \cdot -2}$$
$$-32$$

- ① Any negative bases must have brackets/parentheses.
- ② A negative base raised to:
- an even exponent will be positive
 - an odd exponent will be negative.
- because groups of 2 negatives become positive.