

Assignment #5: Evaluation

Often an expression contains letters which stand for numbers. These letters are called **variables** because their values may vary. To **evaluate** the expression, substitute the value of the variable in a set of grouping symbols (usually parentheses), then simplify using order of operations.

Example: Evaluate $-x^2$ using the value $x=-3$

$$\begin{aligned} -x^2 &= -(-3)^2 && \text{Substitute -3 in parentheses for x} \\ &= -(9) && \text{Now square the (-3), getting 9,} \\ &= -9 && \text{And make it negative.} \\ & && \text{(NOT } - - 3^2 = - - 9 = 9) \end{aligned}$$

Example: Evaluate $-x^2 + zy$ using the values $x=-1, y=2, z=-3$

$$\begin{aligned} -x^2 + zy & && \text{Here's the original problem} \\ -(-1)^2 + (-3)2 & && \text{Substitute in parentheses for the variables} \\ -1 + 9 & && \text{Exponents first} \\ 8 & && \text{Then addition} \end{aligned}$$

Problems

Simplify without using your calculator (or Jimmy's calculator).

- | | | |
|-----------------------------|----------------------|-----------------------|
| a. $-(-2) \cdot (-5^2) - 3$ | b. $3 - 8 \div (-2)$ | c. $4 - 4 \div (-16)$ |
|-----------------------------|----------------------|-----------------------|
- | | | |
|------------------------|-----------------------|-----------------------------------|
| a. $-9 \div (-5 - 13)$ | b. $-3 \cdot 3^2 - 4$ | c. $-2 \cdot [-(-7) \div 14]^2$ |
|------------------------|-----------------------|-----------------------------------|
- | | | |
|----------------|--------------|----------------|
| a. $(-1)^{40}$ | b. -1^{40} | c. $(-1)^{47}$ |
|----------------|--------------|----------------|

4. The noted mathematician, Kurt C. Nicely, once found a number with the following property: 23 more than 6 times the number was the same as 5 times the quantity four less than the number, plus twice the number. Unfortunately, he put the number in his iPod, forgot about it, and eventually deleted accidentally. Find this remarkable number and classify it fully.

Evaluate, using the values $x=-1$, $y=2$, $z=-3$. No calculators, please.

5. a. $xz^y + x - z$ b. $x^2z - xz$ c. $yz - xz - z^y$

(Optional): What is the probability that a randomly selected, positive, 2-digit integer is a multiple of 14? Express your answer as a common fraction.