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Order of Operations

SOL 7.2

Example

Which set shows the correct order of operations to use when evaluating the expression below?

$$13 - 5 + 6 \times 2$$

- A subtract, add, multiply
 B multiply, subtract, add
 C subtract, multiply, add
 D multiply, add, subtract

Example

Find the value of the expression.

$$15 - (9 + 6) \div 3$$

- A 0 C 8
 B 4 D 10

Thinking It Through

Skim Make sure you look carefully at all the answer choices. Notice that the same three operations are listed in a different order in each.

Use the rules for **Order of Operations**. There are no grouping symbols, so first multiply and divide:

$$\begin{array}{r} 13 - 5 + 6 \times 2 \\ 13 - 5 + 12 \end{array} \quad \text{multiply}$$

Then add and subtract, from left to right:

$$\begin{array}{r} 13 - 5 + 12 \\ 8 + 12 \\ 8 + 12 \\ 20 \end{array} \quad \begin{array}{l} \text{subtract} \\ \\ \text{add} \end{array}$$

The correct order of operations to use is *multiply, subtract, add*, choice B.

Thinking It Through

$$\begin{array}{r} 15 - (9 + 6) \div 3 \\ 15 - 15 \div 3 \\ 15 - 15 \div 3 \\ 15 - 5 \\ 15 - 5 \\ 10 \end{array} \quad \begin{array}{l} \text{add inside parentheses} \\ \\ \text{divide} \\ \\ \text{subtract} \end{array}$$

The correct value is 10, choice D.

Review

- First, complete operations within **grouping symbols**, such as parentheses (), brackets [], or a fraction bar $\frac{a}{b}$.
- Next, evaluate exponents.
- Next, multiply and divide, from left to right.
- Finally, add and subtract, from left to right.
- You can remember the order with *Please Excuse My Dear Aunt Sally*—**p**arentheses, **e**xponents, **m**ultiply and **d**ivide, then **a**dd and **s**ubtract.

Order of Operations

DIRECTIONS Read and solve each question. Then circle the letter of the best answer.

1 Find the value of the expression.

$$\frac{30 + 18}{15 - 9}$$

- A 2
- B 4
- C 8
- D 11



Be careful! The fraction bar is a grouping symbol!

2 Which equation is *true*?

- F $24 \div 2 - (4 + 8) = 0$
- G $(24 \div 2) - 4 + 8 = 0$
- H $24 \div (2 - 4) + 8 = 0$
- J $24 \div (2 - 4 + 8) = 0$

3 To evaluate the expression below, what should you do first?

$$3 \times (4.2 + 1.8) \div 6 - 2.5$$

- A Add
- B Subtract
- C Multiply
- D Divide

4 Find the value of the expression.

$$\frac{1}{2}(2 + 18) - \frac{2}{25} \times 50$$

- F 1
- G $3\frac{1}{3}$
- H 6
- J 15

5 What is the value of this expression?

$$4 \times (3 - 1) + 7 \times 2$$

- A 22
- B 24
- C 30
- D 36

6 Which expression results in the greatest value?

- F $9 - 3^2 + 4 \times \frac{1}{4} - \frac{1}{8}$
- G $9 - 3^2 + 4 \times (\frac{1}{4} - \frac{1}{8})$
- H $9 - (3^2 + 4) \times \frac{1}{4} - \frac{1}{8}$
- J $(9 - 3)^2 + 4 \times \frac{1}{4} - \frac{1}{8}$