Name:_____

When simplifying numerical expressions, you must follow rules called the **order of operations**. They work as follows:

1) Perform operations within grouping symbols — parentheses ( ), brackets [ ], braces { }, radicals $\sqrt{}$, absolute value bars | |, or in the numerator or denominator of a fraction.

2) Simplify all exponents (including square roots, cube roots, or other radicals).

3) Multiply and/or divide terms in order from left to right.

4) Add and/or subtract terms in order from left to right.

An east way of remembering the order of operations for simplifying numerical expressions is with the abbreviation PEMDAS:

P — parentheses
E — exponents
M — multiplication
D — division
A — addition
S — subtraction

Simplify each expression:

1) $(6 + 2)^2$

2) $3^3 - 3^2 \times 3$

3) $8 \div 2 \times 3 \div 6$

4) $|8 - 5| + |5 - 8|$

5) $8 \cdot 2^2 + 5 - (2^3 - 4)$

6) $15 \div 3 + 4(3 - 2)^2$

7) $(2 + (2^3 \div 2^2))^2$

8) $30 \div (4 + 2(7 - 4)^2 - 3 \cdot 4)$