

# Section 1.9 - Order of operations

~~$$\begin{aligned}
 & 3 + 2 \cdot 4 \\
 = & \underline{5 \cdot 4} \\
 = & \underline{20}
 \end{aligned}$$~~

wrong order  
of operations

$$\begin{aligned}
 & 3 + \underline{2 \cdot 4} \\
 = & 3 + 8 \\
 = & 11
 \end{aligned}$$

correct order

P → parentheses

E → exponents

$\begin{matrix} \boxed{M} \\ \boxed{D} \end{matrix} > \rightarrow$  mult + div from left to right

$\begin{matrix} \boxed{A} \\ \boxed{S} \end{matrix} > \rightarrow$  add + subtract from left to right

L  
R

26.  $62 - \underline{5 \cdot 8} + 27$

$$= \underline{62 - 40} + 27$$

$$= \underline{22 + 27}$$

$$= 49$$

A+S  
left to right

40.  $33 + 6(\underline{56 - 9 \cdot 6})$  P

$$= 33 + 6(\underline{56 - 54})$$

$$= 33 + \underline{6(2)}$$

$$= 33 + 12$$

$$= 45$$

Jobs of Parentheses

1. grouping symbol  
 $(56 - 9 \cdot 6)$  P
2. multiplication  
 $6(2)$  M
3. separating symbols  
 $3 + (-2)$  A

# Exponents

$$3^2 = 3 \cdot 3 \\ = 9$$

$$4^3 = \underline{4 \cdot 4} \cdot 4 \\ = 64$$

$$36. \quad (\underline{3+4})^2 \\ = 7^2 \\ = 49$$

$$22. \quad 5 \cdot \underline{4^2} - 32 \\ = \underline{5 \cdot 16} - 32 \\ = 80 - 32 \\ = 48$$

P  
E  
M  
D  
A  
S

$$\begin{array}{r} 3 \\ 16 \\ \times 5 \\ \hline 80 \end{array}$$

Perform these operations according to the order of operations. Please show each step down the page in the format shown in class.

1.  $2 \cdot 8 + 3$

2.  $7 + 8 \div 2$

3.  $4 \cdot 2^2 - 11$

4.  $264 \div 4 - 7(4)(2)$

5.  $(6 - 2)(3 + 8)$

6.  $162 + 7(47 - 6 \cdot 7)$

7.  $\frac{(4^3 - 2) + 7}{5(2 + 4) - 7}$

8.  $15 + 5[12 - (2^2 + 4)]$

Perform these operations according to the order of operations. Please show each step down the page in the format shown in class.

$$\begin{aligned} 1. & \underline{2 \cdot 8} + 3 \\ & = 16 + 3 \\ & = 19 \end{aligned}$$

$$\begin{aligned} 2. & 7 + \underline{8 \div 2} \\ & = 7 + 4 \\ & = 11 \end{aligned}$$

$$\begin{aligned} 3. & 4 \cdot \underline{2^2} - 11 \\ & = \underline{4 \cdot 4} - 11 \\ & = 16 - 11 \\ & = 5 \end{aligned}$$

$$\begin{aligned} 4. & \underline{264 \div 4} - \underline{7(4)(2)} \\ & = 66 - 28 \cdot 2 \\ & = 66 - 56 \\ & = 10 \end{aligned}$$

$$5. (6 - 2)(3 + 8)$$

$$= 4 \cdot 11$$

$$= 44$$

$$6. 162 + 7(47 - 6 \cdot 7)$$

$$= 162 + 7(\underline{47 - 42})$$

$$= 162 + 7(\underline{5})$$

$$= 162 + 35$$

$$= 197$$

$$7. \frac{(\underline{4^3 - 2}) + 7}{5(\underline{2 + 4}) - 7}$$

$$= \frac{(\underline{64 - 2}) + 7}{5(\underline{6}) - 7}$$

$$= \frac{62 + 7}{30 - 7}$$

$$= \frac{69}{23}$$

$$= 3$$

$$23 \overline{) 69}$$

$$\begin{array}{r} 23 \\ 3 \\ \hline 69 \end{array}$$

$$\begin{array}{r} 23 \\ 23 \\ \hline 23 \\ \hline 69 \end{array}$$

$$8. 15 + 5[12 - (\underline{2^2 + 4})]$$

$$= 15 + 5[12 - (\underline{4 + 4})]$$

$$= 15 + 5[12 - 8]$$

$$= 15 + 5[4]$$

$$= 15 + 20$$

$$= 35$$