Sec. 1-2 Order of Operations

Numerical expressions often contain more than one operation. A rule is needed to let you know which operation to perform first. This rule is called order of operations.

## Order of Operations:

Step 1: Evaluate the expressions inside grouping symbols

Step 2: Evaluate all powers

Step 3: Multiply and/or divide in order from left to right

Step 4: Add and/or subtract in order from left to right

Evaluate each expression:

ex. 
$$15 \div 3 \cdot 6 - 4^{2}$$
  
 $15 \div 3 \cdot 6 - 16$   
 $5 \cdot 6 - 16$   
 $30 - 16$   
 $14$   
ex.  $32 \pm 7^{2} - 5 \cdot 2$ 

ex. 8-6.4÷3  

$$8-24÷3$$
  
 $8-8$   
 $0$   
  
★ex. 24-8÷2+3.4  
 $24-4+3.4$   
 $24-4+13$   
 $20+12$   
 $32$ 

Grouping symbols such as parentheses (), brackets [], and braces {} are used to clarify or change the order of operations. They indicate that the expression within the grouping symbol is to be evaluated first. A fraction bar also acts as a grouping symbol. It indicates that the numerator and denominator should each be treated as a single value.

ex. 
$$2(5) + 3(4+3)$$
  
 $2(5) + 3(7)$   
 $10 - 3(7)$   
 $10 + 21$   
 $31$   
ex.  $\frac{6+4(3)}{3^2 \cdot 4}$   
 $\frac{6+12}{9 \cdot 4}$   
 $\frac{18}{36}$   
 $\frac{1}{3}$ 

$$ex. (15-9) + 3.6$$

ex. 
$$\frac{6^2 - 8}{4(3+7)} \Rightarrow \frac{36 - 8}{4(10)}$$
  
 $\Rightarrow \frac{38 - 4}{40 - 4} \Rightarrow \frac{7}{10}$ 

$$ex. \quad 12 + 3 [2 + (14 - 6 \cdot 2)3]^{2}$$

$$i2 + 3 [2 + (14 - 12)3]^{2}$$

$$i2 + 3 [2 + (2)3]^{2}$$

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EVALUATE

×  $(y^{3}+8) \div 12$  if x=3 and y=4 3 $(4^{3}+8) \div 12$ 3 $(64+8) \div 12$ 3 $(72) \div 12$  $716 \div 12$ (18)

According to market research, the average consumer spends \$78 per trip to the mall on weekends and only \$67 per trip during the week.

a) Write an algebraic expression to represent how much the average consumer spends at the mall in x weekend trips and y weekday trips.

78×+614

78/5)+67(2)

78(5)+67(2)

b) Evaluate the expression to find what the average consumer spends after going to the mall twice during the week and 5 times on the weekends.

