# 1.3

# Order of Operations

**Essential Question**

What is the effect of inserting parentheses into a numerical expression?

# Do Now

**You are about to wrap your friend's gift. What is the correct order of wrapping it up?**

- **Tape it up**
- **Put a bow in it**
- **Put the gift in box**
- **Wrap it using wrapping paper**

# The Need for Order...

**Work with a partner. Find the value of the expression by using different orders of operations. Are your answers the same? (Circle *yes* or *no*.)**

**a.** Add, then multiply. Multiply, then add. Same?

$3 + 4 \times 2 =$ _____ $3 + 4 \times 2 =$ _____ Yes No

**b.** Add, then subtract. Subtract, then add. Same?

$5 + 3 - 1 =$ _____ $5 + 3 - 1 =$ _____ Yes No

**c.** Divide, then multiply. Multiply, then divide. Same?

$12 \div 3 \bullet 2 =$ _____ $12 \div 3 \bullet 2 =$ _____ Yes No

# The Need for Order...

**d.** Divide, then add. Add, then divide. Same?

$16 \div 4 + 4 =$ _____ $16 \div 4 + 4 =$ _____ Yes No

**e.** Multiply, then subtract. Subtract, then multiply. Same?

$8 \times 4 - 2 =$ _____ $8 \times 4 - 2 =$ _____ Yes No

**f.** Multiply, then divide. Divide, then multiply. Same?

$8 \bullet 4 \div 2 =$ _____ $8 \bullet 4 \div 2 =$ _____ Yes No

# Review – Order of Operations

**P**_____

**E**_____

**M**_____

**D**_____

**A**_____

**S**_____

# Practice

**Evaluate the following**

P E M D A S

Left → Right  Left → Right

***a)*** $12 - 2 \times 4$

***b)*** $7 + 60 \div (3 \bullet 5)$

# On Your Own

**Evaluate the following**

P E M D A S

Left → Right  Left → Right

1) $16+5\times2$

2) $47-5\times(32\div4)$

# On Your Own

**Evaluate the following**

**P E M D A S**

**Left →Right  Left →Right**

3) $9+6\times4-7$

4) $24\div(3\bullet5-7)$

# Practice

**Evaluate the following**

P E M D A S

Left → Right  Left → Right

***a)*** $30 \div \left(7 + 2^3\right) \times 6$

# Practice

**Evaluate the following**

P E M D A S

Left → Right  Left → Right

***b)*** $15 \times \left(12 - 3^2\right) \div 9$

# On Your Own

**Evaluate the following**

**P E M D A S**

**Left →Right  Left →Right**

5) $7 \bullet 5 + 3$

6) $(28 - 20) \div 4$

# On Your Own

**Evaluate the following**

P E M D A S

Left → Right  Left → Right

7) $6 \times 15 - 10 \div 2$

8) $6 + 2^4 - 1$

# Practice

**Evaluate the following**

P E M D A S

Left → Right  Left → Right

***a)*** $9+7(5-2)$

# Practice

**Evaluate the following**

P E M D A S

Left → Right  Left → Right

***b)*** $15 - 4(6+1) \div 2^2$

# Practice

**Evaluate the following**

P E M D A S

Left → Right  Left → Right

$c)\ \dfrac{8(3+4)}{7}$

# Real-Life Application

**You buy foam spheres, paint bottles, and wooden rods to construct a model of our solar system. What is your total cost?**

| Item | Quantity | Cost per Item |
|---|---|---|
| Spheres | 9 | $2 |
| Paint | 6 | $3 |
| Rods | 8 | $1 |

# Real-Life Application

A group of people visit a museum.

| Age | Number of People | Admission Price per Person |
|---|---|---|
| 65 and older | 1 | $8 |
| 13–64 | 2 | $12 |
| 12 and under | 4 | $4 |

What is the total admission price?

# On Your Own

**Evaluate the following**

P E M D A S

Left → Right  Left → Right

9) $50 + 6(12 \div 4) - 8^2$

# On Your Own

**Evaluate the following**

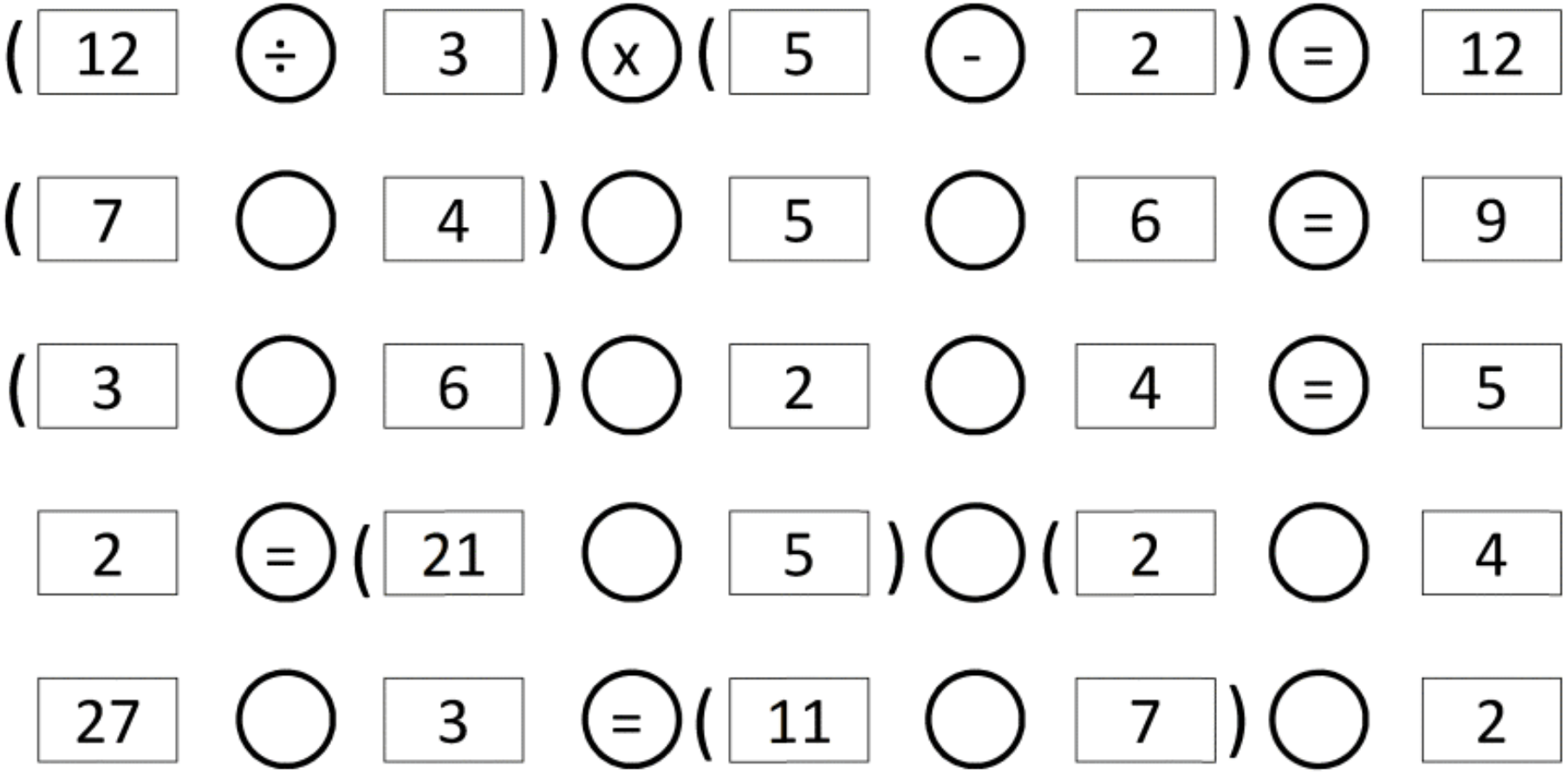
P E M D A S

Left → Right  Left → Right

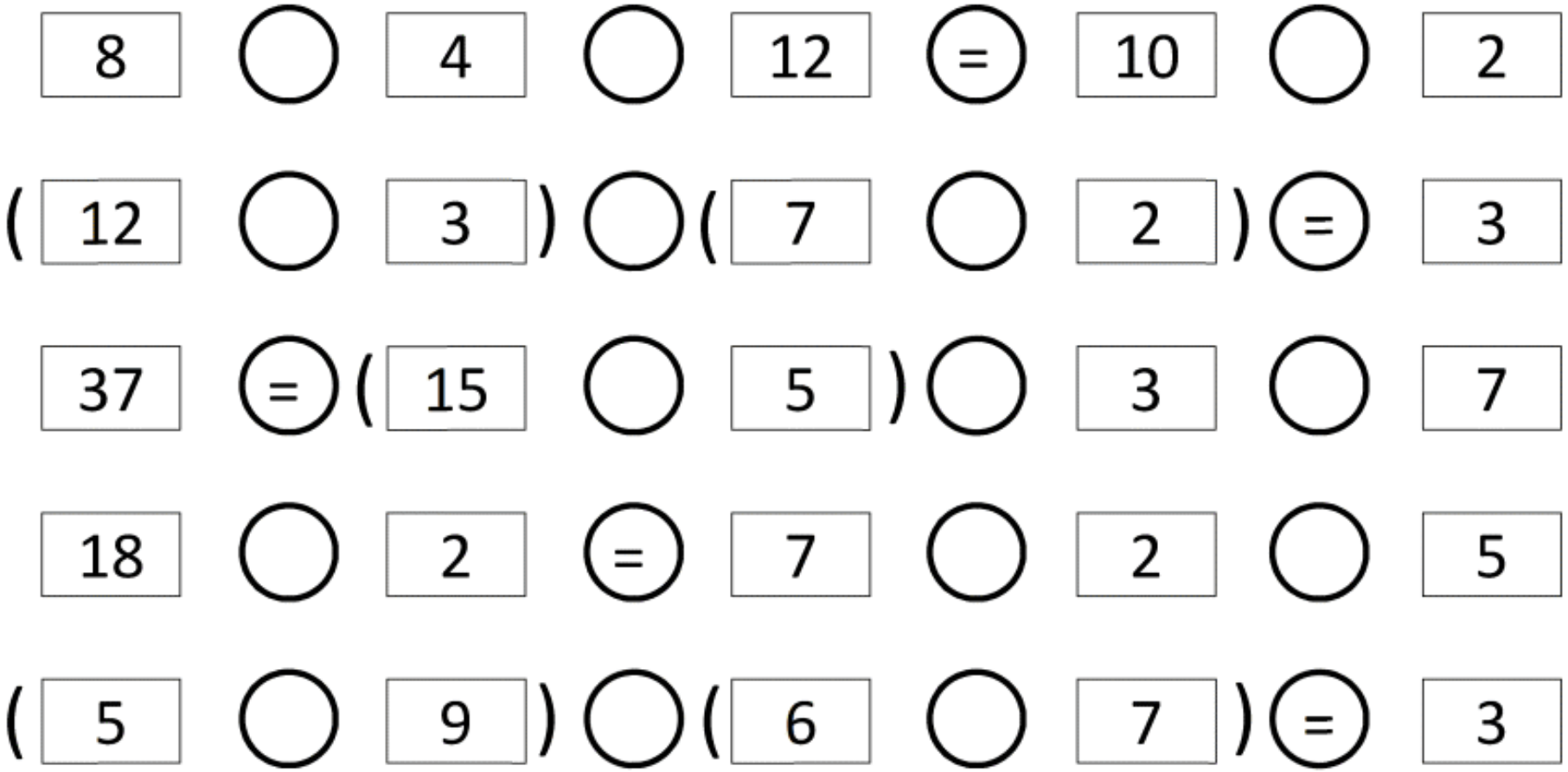
10) $5^2 - 5(10 - 5)$

# Group Work

In each box, choose a sign: +, -, x, or ÷ to make the calculation correct. Remember to use PEMDAS!



# Group Work



# Key Words

- **Evaluate**
- **Numerical Expression**
- **Order of Operations**