# PEMDAS

## Easy Applications

The acronym for this order of operations is PEMDAS.

**P**arentheses    **E**xponents    **M**ultiplication    **D**ivision    **A**ddition    **S**ubtraction

A popular expression for remembering this is **P**lease **E**xcuse **M**y **D**ear **A**unt **S**ally.

**Directions:** Study the Facts and Reminders page for this unit. Then find the numerical value of the following expressions using the correct order of operations.

**1.** 9 x 5 – 4 + 3 x 4 = _____

**2.** 12 + 8 x 6 ÷ 2 x 8 = _____

**3.** 3 + 6 x 8 – 5 x 2 = _____

**4.** 7 + 8 ÷ 4 + 3 – 2 = _____

**5.** 22 ÷ 11 + 12 – 3 = _____

**6.** 9 x 8 – 6 x 3 + 7 = _____

**7.** 13 + 5 x 6 ÷ 2 + 10 = _____

**8.** 35 ÷ 7 x 8 + 2 – 4 x 2 = _____

**9.** 100 ÷ 5 x 5 + 4 – 9 = _____

**10.** 88 ÷ 11 + 56 ÷ 8 + 12 – 5 = _____

Remember the following facts:
- The fraction bar (—) means division.
- The raised dot (•) means multiplication.
- Numbers written next to parenthesis or parentheses next to each other also require multiplication.

**Directions:** Find the numerical value of these expressions.

**11.** $5(8) - \dfrac{30}{5} + 4 \times 3 =$ _____

**12.** $(7)(9) + \dfrac{9}{3} - 20 \times 3 =$ _____

**13.** 8(9) + 10 • 5 + 8 • 2 = _____

**14.** 3 + 8 • 10 – 13 x 3 = _____

**15.** $17 + 5 - 6 \cdot 4 + \dfrac{12}{3} =$ _____

**16.** $9 + \dfrac{44}{4} - 8 \times 2 + 20 - 3 =$ _____

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## Parentheses and Exponents

**Sample**

| | |
|---|---|
| Read the problem. | $3 + (2 \times 4) - 2^2 + 3 = ?$ |
| Do the work in the parentheses first. | $3 + 8 - 2^2 + 3 = ?$ |
| Get the numerical value of the exponent next. | $3 + 8 - 4 + 3 = ?$ |
| Add and subtract in order from left to right. | $11 - 4 + 3 = ?$ |
| | $7 + 3 = ?$ |
| Record your answer. | $3 + (2 \times 4) - 2^2 + 3 = 10$ |

**Directions:** Study the Facts and Reminders page for this unit. Find the numerical value of each expression.

**1.** $(2 \times 3) + 3^2 - 5 \times 3 =$ _____

**2.** $10^2 - (3 \times 30) + 8 =$ _____

**3.** $4 + (2 \times 10) - 2^2 =$ _____

**4.** $8 + (5 \times 5) - 3^2 =$ _____

**5.** $4^2 - 13 + (12 \times 2) =$ _____

**6.** $7^2 + 3(2 \times 4) - 3 =$ _____

**7.** $3 + 5^2 - (12 + 3) =$ _____

**8.** $9 + 4^2 - (5 \times 5) + 2 =$ _____

**9.** $11 - 2^2 + (3 \times 2) - 4 =$ _____

**10.** $2(4 \times 5) + 3^2 - 2^2 =$ _____

**11.** $18 - (3 \times 4) + 5^2 - 2 =$ _____

**12.** $7(4 \times 2) - 4^2 + (2 \times 9) =$ _____

**13.** $10^2 - 3 \times 4 + (6 \times 4) - 5 =$ _____

**14.** $12^2 + 3 - 2(2 \times 4) - 5^2 + 11 =$ _____

**15.** $(15 + 7) \times 2 \times 3 - 6(4 \times 3) + 12 =$ _____

**16.** $(12 - 5) + (2 + 13) - 2^2 + 30 =$ _____

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## Using the Calculator

Check your calculator to determine if it is programmed to follow the algebraic order of operations. Find the numerical value of this expression: 9 x 10 ÷ 2 + 3 x 12 ÷ 2 = ? Do not push the "equal" button between each operation. If your calculator follows the algebraic order of operations, you will get the correct answer which is 63. If it is not programmed, you will get an incorrect answer, 288.
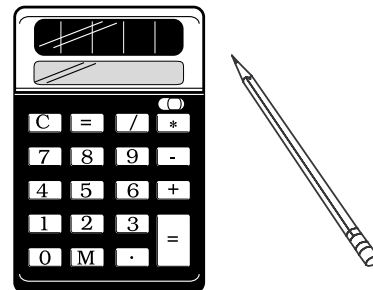
**Directions:** Study the Facts and Reminders page for this unit. If you have a calculator programmed with the algebraic order of operations, use it to help you find the numerical value of these expressions. You can still use unprogrammed calculators to help you do individual multiplication or division calculations. Remember, you must still do the work inside the parentheses first and exponents next before running the expression through the calculator.

**1.** 7 x 3 + 6 − 5 x 4 − 2 + 11 x 3 = _____

**2.** 10 x 14 − 6 + 15 x 8 − 20 + 52 ÷ 2 + 13 = _____

**3.** 27 − 16 + 3 x 16 − 6 x 12 ÷ 3 + 59 − 18 = _____

**4.** 16 x 3 − 7 x 12 + 13 x 6 + 21 ÷ 3 + 29 = _____

**5.** 28 x 10 + 12 x 17 − 13(5 + 2) − 19 + 38 = _____

**6.** $20(4 \times 5) - 12^2 + 6(9 \times 4) - 11 =$ _____

**7.** 7(5 − 2) + (7 x 9) ÷ 3(2 + 5) + 13(2 + 1) = _____

**8.** $(12 \times 8) + (15 \times 4) - 6^2 + 5(9 + 1) + 17 =$ _____

**9.** $12 + 5(30 - 5) - 3^3 + 15(10 + 2) - 18 + 4 \times 2 =$ _____

**10.** $4(5 \times 3) - 2^2 + 3^2 - (3 \times 9) - 23 + 5 \times 3 + 16 =$ _____