

Order of Operations

To evaluate numerical expressions, use a set of rules called the **order of operations**.

Order of Operations
1. Perform operations in P arentheses.
2. Evaluate numbers with E xponents.
3. M ultiply or D ivide from left to right.
4. A dd or S ubtract from left to right.

Example 1 Evaluate each expression.

a. $20 - 5 \cdot 6$

$$\begin{aligned} 20 - 5 \cdot 6 &= 20 - 30 \\ &= -10 \end{aligned}$$

Multiply 5 and 6.

Subtract 30 from 20.

b. $12 \cdot 3 + 4^2 \div 8$

$$\begin{aligned} 12 \cdot 3 + 4^2 \div 8 &= 12 \cdot 3 + 16 \div 8 \\ &= 36 + 16 \div 8 \\ &= 36 + 2 \\ &= 38 \end{aligned}$$

Evaluate 4^2 .

Multiply 12 and 3.

Divide 16 by 8.

Add 36 and 2.

c. $7(5 - 3) + 6^2 \div (-3)$

$$\begin{aligned} 7(5 - 3) + 6^2 \div (-3) &= 7(2) + 6^2 \div (-3) \\ &= 7(2) + 36 \div (-3) \\ &= 14 + 36 \div (-3) \\ &= 14 + (-12) \\ &= 2 \end{aligned}$$

Perform operation in parentheses.

Evaluate 6^2 .

Multiply 7 and 2.

Divide 36 by -3 .

Add 14 and -12 .

Practice

Check your answers at BigIdeasMath.com.

Evaluate the expression.

1. $8 + 2 \cdot 5$

2. $40 \div 8 - 7$

3. $5 \cdot 4^2 \div 8$

4. $1 - 7 + 5^2$

5. $\frac{3 - (-9)}{-10 + 6}$

6. $\frac{2 + 4}{1 - 5} - 1$

7. $(12 - 8)^2 \div 2^5$

8. $18 + 9^2 - 7 \cdot (-3)$

9. $32 \div 8 + 2 \cdot 8^2$

10. $6 \div (7 \div 28)$

11. $36 \div (1 - |2 - 7|)$

12. $(-2)^2 \cdot 5 - 7(9 - 5)$

13. $4(3 + 8) - 8^2 \div 32$

14. $10(3 - 6)^3 + 41$

15. $(2 - 5)^2 - (4 \cdot 5^2)$

16. **RESTAURANT** There are 82 people in a restaurant. Four groups of 3 leave and then five groups of 2 enter. Evaluate the expression $82 - 4(3) + 5(2)$ to find how many people are in the restaurant.