

1-2 Order of Operations (Pages 11–15)

A mathematical **expression** is any combination of numbers and operations such as addition, subtraction, multiplication, and division. To **evaluate** an expression, you find its numerical value. To avoid confusion, mathematicians established the order of operations to tell us how to find the value of an expression that contains more than one operation.

Order of Operations	<ol style="list-style-type: none"> 1. Do all operations within grouping symbols first; start with the innermost grouping symbols. Grouping symbols include parentheses, (), and brackets, []. 2. Next, do all multiplications and divisions from left to right. 3. Then, do all additions and subtractions from left to right.
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EXAMPLES

Find the value of each expression.

A $7 + 8 \div 2 - 5$

$$\begin{aligned} 7 + 8 \div 2 - 5 \\ = 7 + 4 - 5 & \text{ Do multiplications and divisions first.} \\ = 11 - 5 & \text{ Add and subtract from left to right.} \\ = 6 \end{aligned}$$

B $3[(4 + 5) \div (15 - 12)] + 8$

$$\begin{aligned} 3[(4 + 5) \div (15 - 12)] + 8 \\ = 3[9 \div 3] + 8 & \text{ Do operations innermost} \\ & \text{ grouping symbols first.} \\ = 3[3] + 8 & \text{ Multiply, then add.} \\ = 17 \end{aligned}$$

Try These Together

Find the value of each expression.

1. $17 + 4 \cdot 8$

2. $16 \div 4 + 24 \div 8$

3. $3 + 8(2 + 4)$

HINT: Remember to follow the order of operations when finding each value.

PRACTICE

Find the value of each expression.

4. $2(7 - 4) \div 6$

5. $14 - (9 \div 3)$

6. $5 \cdot 6 - 12$

7. $[3(14 \div 7) + 2 \cdot 8] \div 11$

8. $2(3 \cdot 4) \div 6 - 2\left(\frac{6}{3}\right) \div 2$

9. $\frac{9 + 6}{30 - 27}$

10. $18 + (16 - 9) \cdot 4$

11. $42 - 7 \cdot 4$

12. $2[7(3 - 2) + 4(10 - 8)]$

13. $11[2(18 - 13) - 4 \cdot 2]$

14. $7[10(17 - 2) - 8(6 \div 2)]$

15. $4[3(10 - 7) + (11 \cdot 2)]$



16. Standardized Test Practice At a garage sale, Doug earns \$2 for each book he sells, and Linda earns \$3 for each used CD that she sells. Doug sells 15 books and Linda sells 12 CDs. They share the total earnings equally. What is each person's share of the earnings?

A \$66

B \$36

C \$33

D \$30

Answers: 1. 49 2. 7 3. 51 4. 1 5. 11 6. 18 7. 2 8. 2 9. 5 10. 46 11. 14 12. 30 13. 22 14. 882 15. 124 16. C