

1-2

Study Guide and Intervention**Order of Operations**

Evaluate Rational Expressions Numerical expressions often contain more than one operation. To evaluate them, use the rules for order of operations shown below.

Order of Operations	Step 1 Evaluate expressions inside grouping symbols. Step 2 Evaluate all powers. Step 3 Do all multiplication and/or division from left to right. Step 4 Do all addition and/or subtraction from left to right.
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Example 1**Evaluate each expression.**

a. $7 + 2 \cdot 4 - 4$

$$\begin{aligned}
 7 + 2 \cdot 4 - 4 &= 7 + 8 - 4 && \text{Multiply 2 and 4.} \\
 &= 15 - 4 && \text{Add 7 and 8.} \\
 &= 11 && \text{Subtract 4 from 15.}
 \end{aligned}$$

b. $3(2) + 4(2 + 6)$

$$\begin{aligned}
 3(2) + 4(2 + 6) &= 3(2) + 4(8) && \text{Add 2 and 6.} \\
 &= 6 + 32 && \text{Multiply left to right.} \\
 &= 38 && \text{Add 6 and 32.}
 \end{aligned}$$

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LOOK: Show ALL work on attached looseleaf, organize it and label it properly. Thank you, Mr.C.

Example 2**Evaluate each expression.**

a. $3[2 + (12 \div 3)^2]$

$$\begin{aligned}
 3[2 + (12 \div 3)^2] &= 3(2 + 4^2) && \text{Divide 12 by 3.} \\
 &= 3(2 + 16) && \text{Find 4 squared.} \\
 &= 3(18) && \text{Add 2 and 16.} \\
 &= 54 && \text{Multiply 3 and 18.}
 \end{aligned}$$

b. $\frac{3 + 2^3}{4^2 \cdot 3}$

$$\begin{aligned}
 \frac{3 + 2^3}{4^2 \cdot 3} &= \frac{3 + 8}{4^2 \cdot 3} && \text{Evaluate power in numerator.} \\
 &= \frac{11}{4^2 \cdot 3} && \text{Add 3 and 8 in the numerator.} \\
 &= \frac{11}{16 \cdot 3} && \text{Evaluate power in denominator.} \\
 &= \frac{11}{48} && \text{Multiply.}
 \end{aligned}$$

Exercises**Evaluate each expression.**

1. $(8 - 4) \cdot 2$

2. $(12 + 4) \cdot 6$

3. $10 + 2 \cdot 3$

4. $10 + 8 \cdot 1$

5. $15 - 12 \div 4$

6. $\frac{15 + 60}{30 - 5}$

7. $12(20 - 17) - 3 \cdot 6$

8. $24 \div 3 \cdot 2 - 3^2$

9. $8^2 \div (2 \cdot 8) + 2$

10. $3^2 \div 3 + 2^2 \cdot 7 - 20 \div 5$

11. $\frac{4 + 3^2}{12 + 1}$

12. $\frac{8(2) - 4}{8 \div 4}$

13. $250 \div [5(3 \cdot 7 + 4)]$

14. $\frac{2 \cdot 4^2 - 8 \div 2}{(5 + 2) \cdot 2}$

15. $\frac{4 \cdot 3^2 - 3 \cdot 2}{3 \cdot 5}$

16. $\frac{4(5^2) - 4 \cdot 3}{4(4 \cdot 5 + 2)}$

17. $\frac{5^2 - 3}{20(3) + 2(3)}$

18. $\frac{8^2 - 2^2}{(2 \cdot 8) + 4}$