

Please read
the directions
and examples.

1-2 Study Guide and Intervention *LOOK*

Order of Operations

*ALL WORK ON LOOSELEAF
Mr. C.*

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.	PE(MD)(AS) ① ② ③ ④
	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.	

Example 1

Evaluate each expression.

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

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

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

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

Example 2

Evaluate each expression.

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

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

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

Bonus: Convert $\frac{1}{31}$ to a decimal by long division.

Bonus on separate sheet please.

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