

**Arithmetic**  
**Skill-Builder # W - 2**  
**Performing Combined Operations on Whole Numbers**

When performing combined operations on whole numbers, follow **PEMDAS** (**P**arentheses, **E**xponentiation, **M**ultiplication, **D**ivision, **A**ddition, **S**ubtraction). This means everything within parentheses (or any other symbol of grouping) has to be performed first, then all exponentiations; multiplication and division need to be performed in the order in which they appear from left to right; likewise, addition and subtraction need to be performed in the order in which they appear from left to right.

Examples

1.  $12 + 20 \cdot 4$

Solution:

$$\begin{aligned} & 12 + \underbrace{20 \cdot 4} \\ &= 12 + 80 && \text{The operations are A and M, so M goes first.} \\ &= 92 && \text{20 times 4 equals 80.} \\ & && \text{Add 12 and 80 to get 92.} \end{aligned}$$

2.  $18 + 36 \div 9 - 8$

Solution:

$$\begin{aligned} & 18 + \underbrace{36 \div 9} - 8 && \text{D has to be performed before A or S.} \\ &= \underbrace{18 + 4} - 8 && \text{Divide 36 by 9 to get 4.} \\ &= 22 - 8 && \text{Add 18 and 4 to get 22.} \\ &= 14 && \text{Subtract 8 from 22 to get 14.} \end{aligned}$$

3.  $4 \cdot 10 \div 2^3$

Solution:

$$\begin{aligned} & 4 \cdot 10 \div \underbrace{2^3} && \text{E has to be performed before M or D.} \\ &= \underbrace{4 \cdot 10} \div 8 && 2^3 = 2 \cdot 2 \cdot 2 = 8 \\ &= 40 \div 8 && \text{Multiply 4 by 10 to get 40.} \\ &= 5 && \text{Divide 40 by 8 to get 5.} \end{aligned}$$

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

Solution:

$$\begin{aligned} & (5 \cdot 5 - 4 \cdot 5)^2 && \text{Perform the operations inside the parentheses first.} \\ &= (25 - 20)^2 && \text{Multiply 5 by 5 and 4 by 5 to get 25 and 20, respectively.} \\ &= 5^2 && \text{Subtract 20 from 25 to get 5.} \\ &= 25 && 5^2 = 5 \cdot 5 = 25 \end{aligned}$$

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Find the value of the given numeric expression.

1.  $32 - 5 \cdot 6$

2.  $14 + 35 \div 7$

3.  $8 \cdot 3 \div 6$

4.  $48 \div 8 \cdot 5$

5.  $12 + 34 - 28$

6.  $31 - 14 + 42$

7.  $2 \cdot 5^2 - 5$

8.  $20 - 2^2 \cdot 3$

9.  $6 + 45 \div 3^2$

10.  $5 \cdot 2^3 - 2 \cdot 3^2$

11.  $4^2 + 6^2$

12.  $(4 + 6)^2$

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**Answers**

1. 2
2. 19
3. 4
4. 30
5. 18
6. 59
7. 45
8. 8
9. 11
10. 22
11. 52
12. 100

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