

**Order of Operations (involving the four arithmetic operations, parentheses and exponents)**

Grade 6 Expressions & Equations Worksheet

Date: _____

Name: _____

Evaluate each expression using order of operations (**PEMDAS**).**Note:** **MD** (Multiplication and Division is from Left to Right); **AS** (Addition and Subtraction is from Left to Right)

1. $(2^3 + 1^4 \times 3^3) - 2^5 \div 4 = \boxed{}$

Workings:

2. $(3^2 \times 2^3 + 4^2) - 2^4 \div 4 = \boxed{}$

Workings:

3. $(7^2 \div 49 \times 8) + 6 - 2 = \boxed{}$

Workings:

4. $2^5 + 17 - (10^2 \times 2 \div 25) = \boxed{}$

Workings:

5. $14 + 3^3 \times (1^7 - 10^2 \div 100) = \boxed{}$

Workings:



Order of Operations (involving the four arithmetic operations, parentheses and exponents)

Grade 6 Expressions & Equations Answer Sheet

1. $(2^3 + 1^4 \times 3^3) - 2^5 \div 4 = \boxed{27}$

Workings:

$$\begin{aligned} (2^3 + 1^4 \times 3^3) - 2^5 \div 4 & \quad \text{First, evaluate the exponents } 2^3 = 8; 1^4 = 1; 3^3 = 27; 2^5 = 32 \\ & = (8 + 1 \times 27) - 32 \div 4 & \quad \text{Next, simplify the parenthesis } 1 \times 27 = 27 \\ & = (8 + 27) - 32 \div 4 & \quad \text{Again, simplify the parenthesis } 8 + 27 = 35 \\ & = 35 - 32 \div 4 & \quad \text{Then, divide } 32 \div 4 = 8 \\ & = 35 - 8 & \quad \text{Finally, subtract } 35 - 8 = 27 \\ & = 27 \quad \checkmark \end{aligned}$$

2. $(3^2 \times 2^3 + 4^2) - 2^4 \div 4 = \boxed{84}$

Workings:

$$\begin{aligned} (3^2 \times 2^3 + 4^2) - 2^4 \div 4 & \quad \text{First, evaluate the exponents } 3^2 = 9; 2^3 = 8; 4^2 = 16; 2^4 = 16 \\ & = (9 \times 8 + 16) - 16 \div 4 & \quad \text{Next, simplify the parenthesis } 9 \times 8 = 72 \\ & = (72 + 16) - 16 \div 4 & \quad \text{Again, simplify the parenthesis } 72 + 16 = 88 \\ & = 88 - 16 \div 4 & \quad \text{Now, divide } 16 \div 4 = 4 \\ & = 88 - 4 & \quad \text{Finally, subtract } 88 - 4 = 84 \\ & = 84 \quad \checkmark \end{aligned}$$

3. $(7^2 \div 49 \times 8) + 6 - 2 = \boxed{12}$

Workings:

$$\begin{aligned} (7^2 \div 49 \times 8) + 6 - 2 & \quad \text{First, evaluate the exponent } 7^2 = 49 \\ & = (49 \div 49 \times 8) + 6 - 2 & \quad \text{Again, simplify the parenthesis } 49 \div 49 = 1 \\ & = (1 \times 8) + 6 - 2 & \quad \text{Next, simplify the parenthesis } 1 \times 8 = 8 \\ & = 8 + 6 - 2 & \quad \text{Now, add } 8 + 6 = 14 \\ & = 14 - 2 & \quad \text{Finally, subtract } 14 - 2 = 12 \\ & = 12 \quad \checkmark \end{aligned}$$

4. $2^5 + 17 - (10^2 \times 2 \div 25) = \boxed{41}$

Workings:

$$\begin{aligned} 2^5 + 17 - (10^2 \times 2 \div 25) & \quad \text{First, evaluate the exponents } 2^5 = 32; 10^2 = 100 \\ & = 32 + 17 - (100 \times 2 \div 25) & \quad \text{Next, simplify the parenthesis } 100 \times 2 = 200 \\ & = 32 + 17 - (200 \div 25) & \quad \text{Then, simplify the parenthesis } 200 \div 25 = 8 \\ & = 32 + 17 - 8 & \quad \text{Next, add } 32 + 17 = 49 \\ & = 49 - 8 & \quad \text{Finally, subtract } 49 - 8 = 41 \\ & = 41 \quad \checkmark \end{aligned}$$

5. $14 + 3^3 \times (1^7 - 10^2 \div 100) = \boxed{14}$

Workings:

$14 + 3^3 \times (1^7 - 10^2 \div 100)$ **First, evaluate the exponents** $3^3 = 27$; $1^7 = 1$; $10^2 = 100$

$= 14 + 27 \times (1 - 100 \div 100)$ **Next, simplify the parenthesis** $100 \div 100 = 1$

$= 14 + 27 \times (1 - 1)$ **Then, simplify the parenthesis** $1 - 1 = 0$

$= 14 + 27 \times 0$ **Now, multiply** $27 \times 0 = 0$

$= 14 + 0$ **Finally, add** $14 + 0 = 14$

$= 14$ ✓