SmartMathz

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. $(33 \div 3 - 5 \times 2)^2 + (5 - 4 \div 4)^2 =$ ☐

Workings:

2. $(72 \div 8 - 2 \times 3)^2 + (5 - 2 \div 2)^2 =$ ☐

Workings:

3. $(55 \div 5 - 4 \times 8)^2 - (12 \div 6 + 4)^2 =$ ☐

Workings:

4. $(64 \div 8 \times 2)^2 - (39 \div 13 \times 1)^2 =$ ☐

Workings:

5. $(8 \times 6 - 8 \times 3)^2 + (14 - 9 \times 2)^2 =$ ☐

Workings:

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

Grade 6 Expressions & Equations Answer Sheet

1. $(33 \div 3 - 5 \times 2)^2 + (5 - 4 \div 4)^2 = \boxed{17}$

Workings:

$(33 \div 3 - 5 \times 2)^2 + (5 - 4 \div 4)^2$ — First, simplify the parentheses $33 \div 3 = 11; 4 \div 4 = 1$

$= (11 - 5 \times 2)^2 + (5 - 1)^2$ — Again, simplify the parenthesis $5 \times 2 = 10$

$= (11 - 10)^2 + (5 - 1)^2$ — Simplify the parentheses $11 - 10 = 1; 5 - 1 = 4$

$= (1)^2 + (4)^2$ — Then, evaluate the exponents $1^2 = 1; 4^2 = 16$

$= 1 + 16$ — Finally, add $1 + 16 = 17$

$= \mathbf{17}$ ✓

2. $(72 \div 8 - 2 \times 3)^2 + (5 - 2 \div 2)^2 = \boxed{25}$

Workings:

$(72 \div 8 - 2 \times 3)^2 + (5 - 2 \div 2)^2$ — First, simplify the parentheses $72 \div 8 = 9; 2 \div 2 = 1$

$= (9 - 2 \times 3)^2 + (5 - 1)^2$ — Again, simplify the parenthesis $2 \times 3 = 6$

$= (9 - 6)^2 + (5 - 1)^2$ — Simplify the parentheses $9 - 6 = 3; 5 - 1 = 4$

$= (3)^2 + (4)^2$ — Now, evaluate the exponents $3^2 = 9; 4^2 = 16$

$= 9 + 16$ — Finally, add $9 + 16 = 25$

$= \mathbf{25}$ ✓

3. $(55 \div 5 - 4 \times 8)^2 - (12 \div 6 + 4)^2 = \boxed{405}$

Workings:

$(55 \div 5 - 4 \times 8)^2 - (12 \div 6 + 4)^2$ — First, simplify the parentheses $55 \div 5 = 11; 12 \div 6 = 2$

$= (11 - 4 \times 8)^2 - (2 + 4)^2$ — Next, simplify the parenthesis $4 \times 8 = 32$

$= (11 - 32)^2 - (2 + 4)^2$ — Again, simplify the parentheses $11 - 32 = -21; 2 + 4 = 6$

$= (-21)^2 - (6)^2$ — Now, evaluate the exponents $(-21)^2 = 441; (6)^2 = 36$

$= 441 - 36$ — Finally, subtract $441 - 36 = 405$

$= \mathbf{405}$ ✓

4. $(64 \div 8 \times 2)^2 - (39 \div 13 \times 1)^2 = \boxed{247}$

Workings:

$(64 \div 8 \times 2)^2 - (39 \div 13 \times 1)^2$	First, simplify the parentheses $64 \div 8 = 8; 39 \div 13 = 3$
$= (8 \times 2)^2 - (3 \times 1)^2$	Again, simplify the parentheses $8 \times 2 = 16; 3 \times 1 = 3$
$= (16)^2 - (3)^2$	Then, evaluate the exponents $16^2 = 256; 3^2 = 9$
$= 256 - 9$	Finally, subtract $256 - 9 = 247$
$= \mathbf{247}$ ✓	

5. $(8 \times 6 - 8 \times 3)^2 + (14 - 9 \times 2)^2 = \boxed{560}$

Workings:

$(8 \times 6 - 8 \times 3)^2 + (14 - 9 \times 2)^2$	First, simplify the parentheses $8 \times 6 = 48; 9 \times 2 = 18$
$= (48 - 8 \times 3)^2 - (14 - 18)^2$	Again, simplify the parenthesis $8 \times 3 = 24$
$= (48 - 24)^2 - (14 - 18)^2$	Simplify the parentheses $48 - 24 = 24; 14 - 18 = -4$
$= (24)^2 - (-4)^2$	Now, evaluate the exponents $24^2 = 576; (-4)^2 = 16$
$= 576 - 16$	Finally, subtract $576 - 16 = 560$
$= \mathbf{560}$ ✓	