

Order of Operations Lesson & Practice

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Instructions: Use the lesson video (<https://youtu.be/jTzfNSuczsw?si=7bGCFsIglktWhCvd>) to complete the following notes. After you have filled out the notes, complete the practice questions.

Notes

The correct order of operations is:

Parentheses

Exponents

Multiplication

Division

Addition

Subtraction

Example: Evaluate the following expression using the correct order of operations.

$$\begin{aligned}10 - 4 \times (8 - 2) \div 2^3 + 1 \\&= 10 - 4 \times 6 \div 2^3 + 1 \\&= 10 - 4 \times 6 \div 8 + 1 \\&= 10 - 24 \div 8 + 1 \\&= 10 - 3 + 1 \\&= 7 + 1 \\&= 8\end{aligned}$$

Practice

1) Evaluate each of the following expressions using the correct order of operations. Show your work.

a) $(30-3) \div 3$

$$\begin{aligned}&= 27 \div 3 \\&= 9\end{aligned}$$

b) $(21-5) \div 8$

$$\begin{aligned}&= 16 \div 8 \\&= 2\end{aligned}$$

c) $1 + 7^2$

$$\begin{aligned}&= 1 + 49 \\&= 50\end{aligned}$$

$$\text{d) } 5(4) - 8$$

$$= 20 - 8$$

$$= 12$$

$$\text{e) } 8 + 6(9)$$

$$= 8 + 54$$

$$= 62$$

$$\text{f) } 3 + 17(5)$$

$$= 3 + 85$$

$$= 88$$

$$\text{g) } 15 + 40 \div (-20)$$

$$= 15 + (-2)$$

$$= 15 - 2$$

$$= 13$$

$$\text{h) } 9(3+3) \div 6$$

$$= 9(6) \div 6$$

$$= 54 \div 6$$

$$= 9$$

$$\text{i) } (9 + 18 - 3) \div 8$$

$$= (27 - 3) \div 8$$

$$= 24 \div 8$$

$$= 3$$

$$\text{j) } 4(4 \div 2 + 4) + (-9)^2$$

$$= 4(2 + 4) + (-9)^2$$

$$= 4(6) + (-9)^2$$

$$= 24 + 81$$

$$= 105$$

$$\text{k) } [9(-2)] \div (2+1)$$

$$= -18 \div 3$$

$$= -6$$

$$\text{l) } [9(2)] \div 2 + (-1)$$

$$= 18 \div 2 + (-1)$$

$$= 9 - 1$$

$$= 8$$

$$\text{m) } 9 - 7 - 6 \div 6$$

$$= 9 - 7 - 1$$

$$= 2 - 1$$

$$= 1$$

$$\text{n) } [10(2)] \div (1 + 1)$$

$$= 20 \div 2$$

$$= 10$$

$$\text{o) } 7(9) - 7 - 3(5)$$

$$= 63 - 7 - 15$$

$$= 56 - 15$$

$$= 41$$

$$\text{p) } 8 - 1 - (18 - 2) \div (-8)$$

$$\begin{aligned} &= 8 - 1 - 16 \div (-8) \\ &= 8 - 1 - (-2) \\ &= 7 + 2 \\ &= 9 \end{aligned}$$

$$\text{q) } \frac{1}{4} \times (16 \times 3) + 25 \div 5$$

$$\begin{aligned} &= \frac{1}{4} \times 48 + 25 \div 5 \\ &= 12 + 5 \\ &= 17 \end{aligned}$$

$$\text{r) } (5 + 3^2) \div (2^4 \div 2^3)$$

$$\begin{aligned} &= (5 + 9) \div (16 \div 8) \\ &= 14 \div 2 \\ &= 7 \end{aligned}$$

$$\text{s) } 7 + \sqrt{20 - (5 - 1)^2}$$

$$\begin{aligned} &= 7 + \sqrt{20 - (4)^2} \\ &= 7 + \sqrt{20 - 16} \\ &= 7 + \sqrt{4} \\ &= 7 + 2 \\ &= 9 \end{aligned}$$

$$\text{t) } 8 + 5(4 - 1)^3 - 10^2$$

$$\begin{aligned} &= 8 + 5(3)^3 - 10^2 \\ &= 8 + 5(27) - 100 \\ &= 8 + 135 - 100 \\ &= 43 \end{aligned}$$

$$\text{u) } 4 + \sqrt{11 + (2 + 3)^2}$$

$$\begin{aligned} &= 4 + \sqrt{11 + 5^2} \\ &= 4 + \sqrt{11 + 25} \\ &= 4 + \sqrt{36} \\ &= 4 + 6 \\ &= 10 \end{aligned}$$

2) Insert brackets to make each statement true.

$$\text{a) } (4^2 - 7)^2 = 81$$

$$\begin{aligned} (16 - 7)^2 &= 81 \\ 9^2 &= 81 \\ 81 &= 81 \end{aligned}$$

$$\text{b) } (3^2 - 1) \div 5 = 1.6$$

$$\begin{aligned} (9 - 1) \div 5 &= 1.6 \\ 8 \div 5 &= 1.6 \\ 1.6 &= 1.6 \end{aligned}$$

$$\text{c) } 3 + 2[(15) - 7] = 19$$

$$\begin{aligned} 3 + 2(8) &= 19 \\ 3 + 16 &= 19 \\ 19 &= 19 \end{aligned}$$