

1.1 Evaluating Expressions and Order of Operations

NOTES

Name: _____

Write your
questions here!

Opener: Does order matter?

Student 1

$$2 + 5 \times 4$$

Student 2

$$2 + 5 \times 4$$

GEMA

~~PEMDAS~~

First: Parentheses and Brackets

Next: Exponents

(Left to Right)

Then: Multiplication and Division

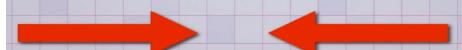
(Left to Right)

Last: Addition and Subtraction

Ex 1: $20 - 10 \div 5$

Ex 2: $40 \div 4 \times 5$

$40 \div 4 \times 5$



Simplify the expression:

Ex 3:

$$\frac{3(25) + 5^2}{50}$$

Ex 4:

$$8[20 - (9-5)^2]$$

NOTES

Variable: a letter used to represent one or more numbers. The numbers are the values of the variables

Algebraic Expression (variable expression): an expression that includes at least one variable.

Evaluate: substitute a number for each variable, perform the operation(s) and simplify the result

Evaluate each expression when $n = 3$

$$n - 2$$

$$5n + 2$$

Evaluate each expression:

$$6y^2 - 13 \text{ when } y = 11$$

$$\frac{b^3 - 21}{5b + 9} \text{ when } b = 3$$

SUMMARY:

Now,
summarize
your notes
here!

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PRACTICE

Simplify the following expressions using the order of operations.

Show work for each step.

1) $13 - 8 + 3$

2) $5 \cdot 2^3 + 7$

3) $2^4 \cdot 4 - 2 \div 8$

4) $24 + 4(3+1)$

5) $\frac{1}{2}(21+2^2)$

6) $8[20 - (9-5)^2]$

7) $(2 + 5)(3 + 4)$.

8) $((2 - 3) \times 4) + 1$

9) $2\{1 + [4(2+1) + 3]\}$.

10) $2 + 4 \times \frac{15}{5}$

11) $16 \div [8 - (10 - 6)]$

12) $2(15 - 18)^2 - 7$

Describe and correct the error in evaluating the expression.

13)

$$\begin{aligned} 20 - \frac{1}{2} \cdot 6^2 &= 20 - 3^2 \\ &= 20 - 9 \\ &= 11 \end{aligned}$$

Simplify the following expressions using the order of operations.

Show work for each step.

14)

$$12 + 16 \div 2^2 - 2$$

15)

$$\frac{(10 - 8) \bullet 9}{5 + 1}$$

16)

$$66 - 2(3^3 - 20) + 3$$

17)

$$\frac{70 \div (12 - 5)}{15 + 3}$$

Directions: Use grouping symbols (like parentheses and brackets) to make each of the statements true. Write the correct statement, with proper grouping symbols, in the space provided.

Examples: $20 - 5 + 10 + 2 = 27$

$20 - 7 + 6 \times 2 = 25$

$1 + 1 \times 2 \times 6 - 1 = 24$

should be grouped as

should be grouped as

should be grouped as

$(20 - 5) + (10 + 2) = 27$

$20 - 7 + (6 \times 2) = 25$

$[(1 + 1) \times 2] \times 6 - 1 = 24$

18)

$5 \bullet 3 + 7 = 22$

19)

$6 + 5 \bullet 3 - 2 = 11$

20)

$7 + 11 - 10 + 2 = 6$

21)

$6 + 6 \div 2 \bullet 6 - 1 = 30$

Simplify the following expressions.

Show work for each step.

22)

$$|-7 + -2| - 4$$

23)

$$|9 + 1| + |-8 + 4|$$

24)

$$\frac{-8}{|-7 + -1|} + 4$$

25)

$$\frac{|7 - 15|}{|1 - 9|} + |-11|$$

26)

$$5\sqrt{\frac{16}{25}} - \sqrt{144}$$

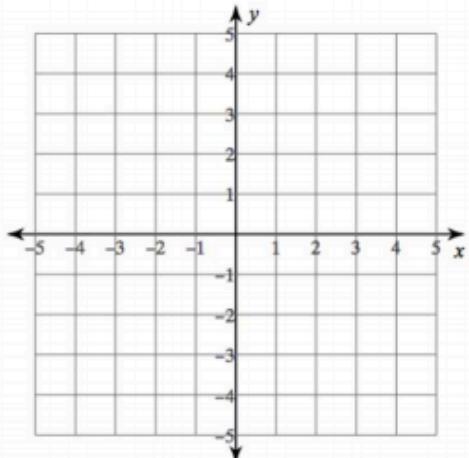
27)

$$2 + \sqrt{15 - 2 \times 3}$$

Evaluate the expression.

Show work for each step.

28) $x + y$ when $x = 11$ and $y = 6.4$ **29)** $y - 2x$ when $x = 0.6$ and $y = 1.4$ **30)** $x^2 - 3$ when $x = -2$.**31)** $6t^2 - 13$ when $t = 2$ **32)** $3(m^2 - 2)$ when $m = \frac{3}{2}$ **33)** $\frac{b^3 - 21}{5b + 9}$ when $b = 3$

Skillz Review		
Plot the points: 1) (4, -2) 2) (0, 3)	Simplify: 3) $\frac{5-(-3)}{10-6}$	Simplify: 4) $-2(-1)^2 + 4$
	5) $\frac{10-16}{3-(-3)}$	6) $-4 - \left(\frac{6}{2}\right) + 5(-1)$

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APPLICATION

Directions: EVALUATE:

1) n^3 when $n = \frac{2}{3}$

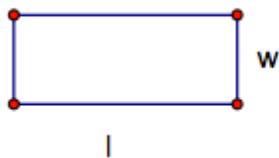
2) $\frac{h^2 - 1}{h + 3}$ when $h = 5$

3) $\frac{5}{8} + \frac{9}{25} \div \frac{18}{15}$

4) $\frac{2}{7} - \frac{5}{3} \times \frac{27}{35}$

5) Find the perimeter of a rectangle with a length of 8.25 inches and a width of 4 inches.

$$\text{Perimeter} = 2(l + w)$$



6) The equation for the area of a trapezoid is $A = \left(\frac{b_1 + b_2}{2}\right)h$. Find the area given

$$b_1 = 20, b_2 = 24, \text{ and } h = 10.$$

$$\text{Area of Trapezoid} = \frac{(b_1 + b_2)h}{2}$$

