

Name: Notes

Date: 8/28

Topic:

Class:

Main Ideas/Questions

Notes \*SHOW WORK/justification NEATLY !!

### Order of Operations

P	Perform Grouping Symbols ( ), [ ], { }, √, fraction bars
E	Evaluate Exponents
MD	Multiplication & Division (left → right)
AS	Addition & Subtraction (left → right)

\* Within grouping symbols, follow order of op. too.

Directions: Simplify each expression.

1.  $29 - (11 - 2^3) + 6^2 \div 4$   
 $29 - (11 - 8) + 36 \div 4$   
 $29 - (3) + 36 \div 4$   
 $29 - 3 + 9$   
 $26 + 9$   
35

2.  $4^3 - |-8| \cdot 6 \div 16$   
 $4^3 - 8 \cdot 6 \div 16$  Exponents  
 $64 - 8 \cdot 6 \div 16$  multiply  
 $64 - 48 \div 16$  divide  
 $64 - 3$   
61 subtract

3.  $\frac{7 - (|10 - 12| + 5^2)}{9 - 2^2}$   
 $\frac{7 - (|-2| + 25)}{9 - 4}$   
 $\frac{7 - (2 + 25)}{5}$   
 $\frac{7 - 27}{5}$   
 $\frac{-20}{5}$   
-4

4.  $\frac{(2 - 3^2)^2 + \sqrt{81}}{10 - 6 \div 3}$   
 $\frac{(2 - 9)^2 + 9}{10 - 2}$   
 $\frac{(-7)^2 + 9}{8}$   
 $\frac{49 + 9}{8}$   
 $\frac{58}{8}$  simplify  
 $\frac{29}{4}$

5.  $\frac{[15 - (-6 + 2 + \sqrt{9})]^2}{3 - 3^3}$   
 $\frac{[15 - (1 - 4 + 3)]^2}{3 - 27}$   
 $\frac{[15 - (-4 + 3)]^2}{-24}$   
 $\frac{(15 - 7)^2}{-24}$   
 $\frac{8^2}{-24} \Rightarrow \frac{64}{-24}$  simplify  
 $-\frac{8}{3}$

6.  $\frac{(9 - 15)^2 \cdot (7 - 2^2) - |-5|}{\sqrt{49} + 5}$   
 $\frac{(-6)^2 \cdot (7 - 4) - 5}{7 + 5}$   
 $\frac{36(3) - 5}{12}$   
 $\frac{108 - 5}{12}$   
 $9 - 5$   
4

### Evaluating Expressions

Directions: Evaluate each expression given the variable replacements.

7.  $\frac{a \cdot b^2}{c + 12}$  (if  $a = 3$ ,  $b = -4$ , and  $c = 8$ )  
 $\frac{(3)(-4)^2}{(8) + 12}$   
 $\frac{3 \cdot 16}{20}$   
 $\frac{48}{20}$  simplify  $\frac{12}{5}$

8.  $|10m - 8n^2|$  (if  $m = 2$  and  $n = -3$ )  
 $|10(2) - 8(-3)^2|$   
 $|10(2) - 8(9)|$   
 $|20 - 72|$   
 $|-52|$   
52

\* Put ( ) around the value you substitute

9.  $-x^2 + 7(y+2) - 1$  (if  $x = 5$  and  $y = -9$ )  
 $-(5)^2 + 7((-9)+2) - 1$   
 $-25 + 7(-7) - 1$   
 $-25 - 49 - 1$   
 $-75$

10.  $3r - 4s$  (if  $r = 5$  and  $s = \frac{2}{3}$ )  
 $3(5) - 4(\frac{2}{3})$   
 $15 - \frac{8}{3}$   
 $\frac{45}{3} - \frac{8}{3}$   
 $\frac{37}{3}$

11.  $|x^2 - y^2| - x \cdot y$  (if  $x = -6$  and  $y = 8$ )  
 $|(-6)^2 - (8)^2| - (-6)(8)$   
 $|36 - 64| + 48$   
 $|-28| + 48$   
 $28 + 48$   
 $76$

12.  $\frac{2}{5}(a+2b)^2$  (if  $a = 3$  and  $b = -4$ )  
 $\frac{2}{5}(3+2(-4))^2$   
 $\frac{2}{5}(3-8)^2$   
 $\frac{2}{5}(-5)^2$   
 $\frac{2}{5}(25)$   
 $2 \cdot 5$   
 $10$

13.  $\frac{w^3 - 4v}{\sqrt{wv}}$  (if  $w = 2$  and  $v = 18$ )  
 $\frac{(2)^3 - 4(18)}{\sqrt{2(18)}}$   
 $\frac{8 - 72}{\sqrt{36}}$   
 $\frac{-64}{6}$   
 $-\frac{32}{3}$

14.  $2m^2 + 9m$  (if  $m = \frac{1}{4}$ )  
 $2(\frac{1}{4})^2 + 9(\frac{1}{4})$   
 $2(\frac{1}{16}) + \frac{9}{4}$   
 $\frac{1}{8} + \frac{9}{4}$   
 $\frac{1}{8} + \frac{18}{8}$   
 $\frac{19}{8}$

**Simplifying Expressions**

\* Distribute first if applicable  
 Like terms contain the same variable raised to the same power.

Directions: Simply each expression below by distributing and/or combining like terms.

15.  $16x - 11 - 7x + 10$   
 $9x - 1$   
 $9x - 1$

16.  $13 + 2(3n - 7) + 19n$   
 $13 + 6n - 14 + 19n$   
 $25n - 1$   
 $25n - 1$

17.  $6(c - 2) - (8c + 1)$   
 $6c - 12 - 8c - 1$   
 $-2c - 13$

18.  $-15y - 7z + y + 9z$   
 $-14y + 2z$

19.  $3(3a - 5b) - (a - 7b)$   
 $9a - 15b - a + 7b$   
 $8a - 8b$

20.  $-8(2x + y) - 3(-5x - 2y)$   
 $-16x - 8y + 15x + 6y$   
 $-x - 2y$