

HW #1: Operations with Integers

Date _____

Evaluate each expression. Do not use a calculator!!

1) $(-4) - (-5)$

2) $(-1) - 6$

3) $(-5) + 1$

4) $(-6) - 5$

5) $2 - 1$

6) $1 + (-5)$

7) $(-4) + 3$

8) $(-3) + 6$

9) $6 - 7$

10) $2 + (-3)$

Find each quotient. Do not use a calculator!!

11) $\frac{1}{-1}$

12) $\frac{-56}{-8}$

13) $\frac{-12}{-6}$

14) $\frac{8}{-8}$

15) $\frac{-21}{7}$

16) $\frac{30}{-10}$

Find each product. Do not use a calculator!!

17) $(-8)(-3)$

18) $(-5)(10)$

19) $(-6)(-3)$

20) $(-4)(8)$

21) $(-4)(9)$

22) $(-2)(-9)$

Warm-up: Order of Operations

Evaluate each expression.

1) $4 + 6 \times 5$

2) $(2 + 16) \div 3$

3) $(8 + 10) \div 6 \times 5$

4) $6 + 4 + 3 \div 3$

5) $\frac{2}{3} + \frac{5}{3}$

6) $\frac{1}{4} + \frac{3}{4}$

7) $\frac{15}{6} - \frac{3}{6}$

8) $\frac{7}{2} - \frac{4}{2}$

Name: _____

Notes: Order of Operations

Date: _____

I. Order of Operations

A. Vocabulary

- _____: the order in which you perform operations in a math problem

o The order of operations tells you the order in which you should go about evaluating problems like these:

Ex) $3 + 5 \times 6$

Ex) $10 \div 2 + 4 \times 3$

Ex) $5 \times (3 + 4) - 3$

B. What is the order? * You should always solve math problems in the following order:

Parenthesis – (also called grouping symbols)

Exponents

Multiplication OR Division – (whichever comes first)

Addition OR Subtraction – (whichever comes first)

C. Parentheses

- The parentheses symbol looks like this _____.

Ex) $7 + (9 + 4)$

- Parenthesis can also look like this _____. We call these _____.

Ex) $3 \times [7 + 1]$

- You ALWAYS want to work from the inside parenthesis to the outside parenthesis.

Ex) $3 + [4 - (2 \cdot 1)]$

Examples:

Directions: Simplify each expression.

Ex) $7 + (8 \div 4)$

Ex) $3(7 + 4)$

Ex) $3(20 - 14) + (9 \cdot 1)$

Ex) $2 + [5 - (3 \cdot 1)]$

Ex) $[(5 + 2) - 2] \times 6$

D. Defining Powers & Exponents

- The following is an example of an exponent and its base:

• We say this is “_____ to the _____”
_____.”

• The exponent tells you how many times you should multiply the
_____ by _____.

Examples:

Directions: Simplify each expression.

Ex) $2^0 =$

Ex) $2^1 =$

Ex) $2^2 =$

Ex) $2^3 =$

Squared & Cubed

- Any integer that has 2 for an exponent is said to be “_____.”
- Any integer that has 3 for an exponent is said to be “_____.”

Zero as An Exponent

- When any integer has 0 as an exponent, it is ALWAYS equal to _____.

$$\text{Ex) } 4^0 =$$

$$\text{Ex) } 12^0 =$$

One as An Exponent

- Any integer with 1 as an exponent is ALWAYS equal to _____.

$$\text{Ex) } 10^1 =$$

$$\text{Ex) } 3^1 =$$

$$\text{Ex) } 31^1 =$$

Any Power w/ a Base of One

- When the integer 1 has an exponent (any exponent), it is ALWAYS equal to _____.

$$\text{Ex) } 1^4 =$$

$$\text{Ex) } 1^1 =$$

$$\text{Ex) } 1^9 =$$

Examples:

Directions: Simplify each expression.

$$\text{Ex) } 4(1 + 1)^2$$

$$\text{Ex) } 49 - (3 \cdot 2)^2$$

$$\text{Ex) } 5(5 - 2)^2$$

$$\text{Ex) } 70 - 3 - (4 \div 2)^2$$

$$\text{Ex) } [10 - 2^2] + [4^2 - 10]$$

$$\text{Ex) } (5 + 2)^2 - 2 + [4^2 + 3]$$

E. Multiplication AND Division

- Multiply and divide in order from _____ to _____.

o This does not mean that you always multiply first before you divide. You should multiply or divide depending on whichever operation comes first as you work from left to right.

Examples:

Directions: Simplify each expression.

Ex) $7 \div 1 \times 3$

Ex) $3^2 \times 4 \div 1$

Ex) $2^2 \cdot (4 \times 3)$

Ex) $27 \div (3 \times 1)^2$

Ex) $6 \div 2[1 + (1 \cdot 2)]$

Ex) $2[(1 \cdot 2)^3 - 6] + (11 - 6)$

F. Addition AND Subtraction

- Add and subtract in order from _____ to _____.

o This does not mean that you always add first before you subtract. You should add or subtract depending on whichever operation comes first as you work from left to right.

Examples:

Directions: Simplify each expression.

Ex) $3 \times 5 - 8 \div 4 + 6$

Ex) $3^2 \div 3 + 4 \times 4 - 2$

Ex) $6 + 2(4 + 1)^2$

Ex) $1 + (3 \cdot 2) \times 2 - 2^3$

Ex) $[4(2+1)] + 6 \cdot 3^2$

G. Order of Operations Involving Fractions

- Whenever you see an order of operations problem involving fractions like this:

$$\frac{(2+3)^2 + 3}{2+15 \div 3}$$

Step 1) Simplify the numerator (or top) as if it is its own PEMDAS problem.

Step 2) Simplify the denominator (or bottom) as if its own PEMDAS problem

Step 3) Then divide out to find the answer.

$$\text{Ex) } \frac{16+24}{30-22}$$

$$\text{Ex) } \frac{(3 \cdot 3) - 4}{12 \div 4 + 1^4}$$

H. Order of Operation Practice Problems

Directions: Simplify each expression.

$$\text{Ex) } 4 + 3 \times 5$$

$$\text{Ex) } 10 + 4 \div 2^2$$

$$\text{Ex) } 4 - 1 \cdot 2 + (6 \div 3)$$

$$\text{Ex) } (6 - 3)^2 \cdot 4 \div 9 - 1$$

$$\text{Ex) } 13 - 4(3 + 2) \div 2^2$$

$$\text{Ex) } \frac{2(3-1)^2}{1+1} \cdot 3+3$$

$$\text{Ex) } 10^2 \div [9 - (2 \cdot 2)] + 1(4)$$

HW #2: Order of Operations

Date _____

1) $(2 + 3)^2 - 1$

2) $2 \cdot 4 \cdot 5$

3) $6 \div 3 \cdot 4$

4) $\frac{8 - 5 \cdot 2}{6 \cdot 2 - 10}$

5) $[3 + (5 - 1)] \div 6$

6) $4 - 5(9 - 2)$

7) $-2(6 - 3)^2 + 4$

8) $5^2 \div [(-2 - 3) + 4]$

9) $10 - 3(-1 + 4) \div 3$

10) $[(15 - 3) \div 4]^2 - 5^2$

Write each of the following fractions in simplest form. No mixed numbers.

11) $\frac{6}{8}$

12) $\frac{12}{4}$

13) $\frac{16}{18}$

14) $\frac{15}{30}$

15) $\frac{17}{6}$

16) $\frac{24}{18}$

Evaluate each expression.

17) $(-7) - 1$

18) $\frac{-54}{-6}$

19) $8 - (-4)$

20) $(-7)(-1)$

21) $\frac{-24}{4}$

22) $(-6)(8)$

21

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Name _____ Date _____

Warm-up

1. $2(3 + 2^2) - 10 + 6$

2. $\frac{2 \times 4}{8} - 6(4 + 2)$

3. $3^2 + \frac{9+7}{2}$

4. $10 - (6 + 4)^2 + 9$

5. Decide whether the following statement is true or false. Explain your answer.
We always do PEMDAS!!

HW #3: Evaluating Expressions

Evaluate each of the following expressions. Remember Order of Operations!!

1) $3x + 5$ if $x = -3$

2) $2(x - 3)^2 + 4$ if $x = 5$

3) $3x - 5(x + 4)$ if $x = 0$

4) $2x^2 - 5x + 1$ if $x = 3$

5) $x^2 + 2x - 5$ if $x = -2$

6) $2(x + 3) - 5x$ if $x = -4$

7) $3a + 4b$ if $a = -2$ and $b = 5$

8) $4(x + 2) - y$ if $x = 3$ and $y = -5$

9) $4(x + 2) - y$ if $x = 3$ and $y = -5$

10) $\frac{6a - 5}{3b + 4}$ if $a = 2$ and $b = 1$

Evaluate each expression.

11) $(-1) + (-1)$

12) $5 - (-1)$

13) $\frac{4}{-4}$

14) $(-2)(-7)$

Perform the indicated operation.

15) $\frac{5}{6} + \frac{4}{6}$

16) $\frac{1}{3} - \frac{5}{3}$

17) $\frac{2}{7} - \frac{5}{7}$

18) $\frac{5}{2} + \frac{8}{2}$

19) Explain how you would add or subtract fractions that do NOT have the same denominator.