10-01-18

Aim: SWBAT evaluate expressions using the correct order of operations.

HW: Packet Page 54

Review Packet due Wednesday

Test Thursday

Do Now: Packet Page 52

AIM: SWBAT apply their knowledge of rational numbers to real world ~~applications~~ situations.

Solving word problems with rational numbers does not have to be difficult. (Remember, RATIONAL NUMBERS INCLUDE integers, fractions, mixed numbers, and terminating decimals, and repeating decimals.) First, you will need to remember all of your rules for adding, subtracting, multiplying, and dividing rational numbers.

The other important skill is READING . . . yes you will have to read in math class. You will need to look for key words in each word problems to help you decide which operation you will need to use. For example, "how many miles do they have left?" would indicate subtraction. You should underline or highlight these key words in the word problem to help you.

CLASSWORK: (Finish for Homework—Be sure to write an numerical expression and evaluate.)

1) Joe's apple weighs $\frac{4}{5}$ lb. Marta's apple weighs 0.6 lb. How much more does Joe's apple weigh than Marta's?

$\frac{4}{5} - 0.6$

$\frac{4}{5} - \frac{3}{5}$

$\frac{1}{5}$

Joe's apple weighs $\frac{1}{5}$ lb more than Marta's apple.

2) At 2:30 A.M. the temperature in Alaska is −5°F. Over the next hour, the temperature drops $1\frac{3}{4}$ of a degree. What is the temperature at 3:30 A.M.?

$-5 - 1\frac{3}{4}$

$-6\frac{3}{4}$

The temperature at 3:30 A.M. is $-6\frac{3}{4}$ °F.

3) Rebecca's bank statement shows a deduction of $1.50 ~~taken out of her account~~ each week. How many weeks will it take before the total deduction is $12?

$12 \div 1.50$

-8

It will take 8 weeks to deduct $12.

47

4) The depth of a small submarine changes by $-\frac{3}{8}$ mile after each exploration. After how many explorations will the submarine's depth have changed by −1.5 miles?

$-1.5 \div -\frac{3}{8}$

$-1\frac{1}{2} \div -\frac{3}{8}$

$-\frac{3}{2} \cdot -\frac{8}{3}$

4

It will take 4 explorations for the submarine's depth to change by −1.5 miles.

5) The amount of shore at a local beach changes an average of $-\frac{3}{4}$ foot each year. What is the change in the amount of shore after 7.75 years?

$-\frac{3}{4} \cdot 7.75$

$-\frac{3}{4} \cdot 7\frac{3}{4}$

$-\frac{3}{4} \cdot \frac{31}{4}$

$-\frac{93}{16}$

$-5\frac{13}{16}$

The shore line erodes $5\frac{13}{16}$ feet in 7.75 years.

6) Mitch is cutting a piece of fabric that is $4\frac{4}{5}$ feet long into smaller strips that are 0.8 feet long. How many strips will Mitch have when he is done?

$4\frac{4}{5} \div 0.8$

$\frac{24}{5} \div \frac{4}{5}$

$\frac{24}{5} \cdot \frac{5}{4}$

6

Mitch will have 6 strips when he is done.

7) A birdbath is filled to the top. On Day 1, the volume of water in the bowl decreases by $\frac{7}{8}$ cup. On Day 2, the volume of water in the bowl decreases by 0.75 cup. What is the total change in the volume of water in the bowl after two days?

$-\frac{7}{8} - 0.75$

$-\frac{7}{8} - \frac{3}{4}$

$-\frac{7}{8} - \frac{6}{8}$

$-\frac{13}{8} \rightarrow -1\frac{5}{8}$

The volume of the water decreased by $1\frac{5}{8}$ cups.

48

8) At midnight, the temperature in Alto is -3.8°F. The wind chill makes the temperature feel $5\frac{3}{5}$°F colder than the actual temperature. What is the wind chill temperature?

$-3.8 - 5\frac{3}{5}$

$-3\frac{4}{5} - 5\frac{3}{5}$

$\frac{-19}{5} - \frac{28}{5}$

$\frac{-47}{5}$

$-9\frac{2}{5}$

The wind chill temperature is $-9\frac{2}{5}$°F.

9) Browning, Montana, holds the U.S. record for the greatest temperature drop in one day. On January 23, 1916, the temperature changed by an average of -4.17°F per hour. **To the nearest degree**, what was the total temperature change after 24 hours?

$(-4.17)(24)$

$$\begin{array}{r} {}^{1}4.17 \\ \times\ 24 \\ \hline 1668 \\ +\ 834\ x \\ \hline 100.08 \end{array}$$

100.08 → 100

The temperature change was about 100°F.

10) Beth plays a video game in which she starts with 0 points. In round 1, she loses $3\frac{1}{2}$ points; in round 2, she wins 28.5 points; and in round 3, she loses another $3\frac{1}{5}$ points. What is her final score?

$-3\frac{1}{2} + 28.5 - 3\frac{1}{5}$

$-3\frac{5}{10} + 28\frac{5}{10} - 3\frac{2}{10}$

$\frac{-35}{10} + \frac{285}{10} - \frac{32}{10}$

$\frac{218}{10}$

$21\frac{8}{10} \Rightarrow 21\frac{4}{5}$

Her final score is $21\frac{4}{5}$ points.

49

11) Paige regularly babysits the 3 neighbor children. She gets paid $4.50 per hour for each child.

Part A - Paige babysat the neighbor children for 3 hours. How much money did she earn?

$(4.50)(3)(3)$

$(13.50)(3)$

40.50

Paige earned $40.50.

Part B - Paige was asked if she was available next week to babysit all 3 children for 8 hours. Paige decided to have a friend help her and will give her half the earnings. How much will Paige and her friend each earn?

$(4.50)(3)(8)$

108

$108 \div 2$

54

Paige and her friend will each earn $54.

Part C - The neighbors are having another child. Paige wants to ask for $0.75 raise per child per hour. If she gets the raise, how much more will she earn watching 4 children at her new rate than watching 3 children at her old rate for 3 hours?

$4.50 + 0.75$

5.25

$(5.25)(4)(3)$

63

$63 - 40.50$

22.50

Paige will earn $22.50 more.

50

AIM: SWBAT evaluate expressions using the correct order of operations.

DO NOW: Read the notes below and answer #'s 1 – 8 at the bottom of the page.

Order of Operations

PE-MD-AS

( ) [ ] { }

P → Parentheses → GROUPING SYMBOLS

- Do all operations within **grouping symbols** first; If there is more than one set of grouping symbols, work from the inside out
- In the example, [2 + (5 – 3) • 6], you would do (5 – 3) first since it is INSIDE.

E → Exponents

M/D → Do all multiplication and division in order from left to right. (Whichever comes first)

A/S → Do all addition and subtraction in order from left to right. (Whichever comes first)

NOTE: Sometimes expressions are written with a fraction bar to indicate division.

Example: $\frac{(48-24)}{(24-12)} \rightarrow \frac{24}{12} \Rightarrow 2$

Evaluate the numerator → 24
Evaluate the denominator → 12
Last step Divide → $\frac{24}{12}$ = 2

Ladder of Hierarchy

P
E
M D
A S

State the FIRST OPERATION (+, –, •, ÷) you would use to evaluate the following examples.

1) (25 + 11) • 3 ___+___

2) 5 – 8 + 6 ÷ 6 – 12 • 2 ___÷___

3) 12 ÷ (6 – 3 + 8) – 5 ___–___

4) 25 – 4^2 + 16 ÷ 8 ___•___

5) 5 + 8 ÷ 6 • 12 ___÷___

6) 150 ÷ (6 + 3 • 8) – 5 ___•___

7) 5 + 8 • 6 ÷ 12 ___•___

9) 6 + (5 – 9.7) + 2^2 ___–___

52

Evaluate each expression using the correct order of operations. Show all work step-by-step. *All answers are integers *

EX: $12 - 16 \div 2 + 5$

$12 - 8 + 5$

$4 + 5$

9

P
E
MD
AS

1) $27 - 21 \div -3 + 5$

$27 + 7 + 5$

$34 + 5$

39

2) $-47 + 14 \div 2 \bullet -3 - 18$

$-47 + 7 \cdot -3 - 18$

$-47 + (-21) - 18$

$-68 - 18$

-86

3) $-3 \bullet 3 + 63 \div 9$

$-9 + 63 \div 9$

$-9 + 7$

-2

4) $56 \div (27 + 12 - 31)$

$56 \div (39 - 31)$

$56 \div 8$

7

5) $(7 - 4)^2 + -8$

$3^2 + -8$

$9 + -8$

1

6) $27 - 6 + 12 \bullet -3$

$27 - 6 + (-36)$

$21 + (-36)$

-15

7) $(2^3 + 2) \bullet 6 \div 3 - 24 \div 8$

$(8 + 2) 6 \div 3 - 24 \div 8$

$10 \cdot 6 \div 3 - 24 \div 8$

$60 \div 3 - 24 \div 8$

$20 - 24 \div 8$

$20 - 3$

17

8) $\dfrac{2^2 + 5 \times 4}{4 + 8}$

$\rightarrow \dfrac{4 + 5 \cdot 4}{12}$

$\rightarrow \dfrac{4 + 20}{12}$

$\rightarrow \dfrac{24}{12}$

$\rightarrow 2$

27

HOMEWORK – ORDER OF OPERATIONS

Evaluate each expression.

1) $12 - 3 \bullet 3$

2) $9 - 4 \div 2$

3) $\frac{16}{11-3}$

4) $6 \bullet 3 + (9 - 7)$

5) $5 \bullet [24 \div (5 + 3)] - 11$

6) $7 \times 8 + 63 \div 9$

7) $-8 \bullet 5 - 12$

8) $\frac{-24}{9-5}$

9) $-6 \times 8 - 7 \times 4$

10) $18 - 3 \bullet 5 - -2$

11) $(6 - 2^2) \bullet -5$

12) $[21 - (3 \bullet 7)] + 6$

13) $(3^2 + 3) \times 3 + 5$

14) $(20 \div -5) + (8 \bullet 7)$

15) $28 \div 4 \bullet (6 - 5)$

Add parentheses to make the statement true.

16) $7 + 3 \times 4 - 1 = 39$

17) $3 \times 6 - 1 + 2 = 17$

18) $9 - 4 + 2 \bullet 7 = 49$

19) $6 - 3 \bullet 7 + 4 = 33$

54