R.1-R.3 In-class Practice Math 085

1. Let $S = \left\{-9, -\frac{4}{3}, -\sqrt{4}, -0.25, 0, 0.\overline{35}, \frac{5}{3}, \sqrt{7}, \frac{\pi}{2}, \sqrt{-9}, \frac{12}{3}\right\}$. List elements of S that belong to:
   a) Whole Numbers
   b) Integers
   c) Rational Numbers
   d) Irrational Numbers

2. Write each set by listing its elements.
   a) $\{x | x \text{ is a natural number less than } 6\}$
   b) $\{p \in \mathbb{Z} | p < 3\}$
   c) $\{n \in \mathbb{Z} |\ n > 8,\ n \text{ is an even}\}$
   d) $\{a | a \text{ is a number whose absolute value is } 4\}$

3. A student claimed that $\{x | x \text{ is a natural number grater than } 3\}$ and $\{y | y \text{ is an integer grater than } 3\}$ name the same set. Is that correct? What if we replace 3 by -3?

4. Use set-builder notation to represent the set
   a) {6, 8, 10, … , 20}
   b) {4, 8, 12, 16, …}
   c) the real numbers between -2 and 5
   d) the real numbers between 0 and 2, inclusive

5. *True or False:*
   a) Every integer is a whole number.
   b) Every natural number is a whole number.
   c) Every integer is a rational number.
   d) Some rational numbers are irrational.
   e) The absolute value of any number is the same as the absolute value of its additive inverse.

6. Simplify.
   a) $-|-8| + |-4|$
   b) $13 - |6 - 12|$
   c) $-9 - |-7 - (-15)|$

7. *Critical Thinking:*
   Suppose a and b are two real numbers such that $a < b$. Under what circumstance will $|a| > |b|$?

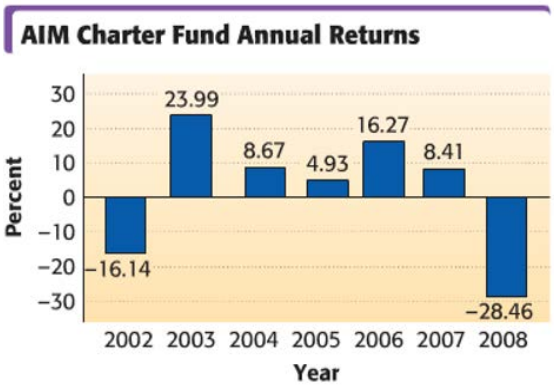
8. Use an inequality to write each statement:
   a) $3t - 4$ is less than or equal to 10
   b) p is between -2 and 5
   c) $3x$ is between -3 and 4, including -3 and excluding 4

9. Graph each set and write it using interval notation if possible.
   a) $\{x | x \leq 6\}$
   b) $\{n \in \mathbb{Z} | -2 \leq n < 5\}$
   c) $\{a | -1 < a < 1\}$
   d) $\{x | -2 < x \leq 5\}$

10. Find the distance between the two points on the number line:
   a) $-7, -32$
   b) $\frac{2}{3}, -\frac{5}{6}$

11. Kayla has $37.60 in her checking account. She uses her debit card to make purchases of $25.99 and $19.34, which overdraws her account. Her bank charges her account an overdraft fee of $25.00. She then deposits her paycheck for $58.66 from her part-time job at Subway. What is the balance in her account?

12. The graph shows annual returns in percent for Class A shares of the AIM Charter Fund for the years 2002 through 2008.



a) Find the sum of the Percents for the shown years.

b) Find the difference between the returns in 2003 and 2002.

c) Find the difference between the returns in 2008 and 2007.

13. Simplify each expression. Use the order of operations.

a) $\left(-\frac{5}{4}-\frac{2}{3}\right)+\frac{1}{6}$ b) $\frac{5}{6}\left(-\frac{9}{10}\right)\left(-\frac{4}{5}\right)$ c) $-8\sqrt{64}-(-3)(-7)$

d) $-12\left(-\frac{3}{4}\right)-(6\cdot 5\div 3)$ e) $\frac{(-9+\sqrt{25})(-3^2)}{-5+1}$ f) $\frac{4|6-7|-5\cdot 4}{6\cdot 7-8|4-1|}$

14. Evaluate the expression for $a=-3,\ b=4, c=6,\ p=0$, and $q=-1$.

a) $-3a^4-3c$ b) $2c\div 3b$ c) $-4(p+2q)^2$

15. The Blood Alcohol Concentration (BAC) of a person who has been drinking is given by the expression: $\#\ of\ oz\ \times\%\ alcohol\ \times 0.075\ \div body\ weight\ in\ lb-hr\ of\ drinking\ \times 0.015$
Find the BAC to the nearest thousandth for a 135-lb woman who, in 3 hr, has drunk three 12-oz beers, each having a 4% alcohol content.

16. Complete each statement.

a) The commutative property is used to change the _____ of factors.
b) The associative property is used to change the _____ of factors.
c) The additive inverse of a is _____.
d) The multiplicative inverse of a, where $a\neq 0$, is ____.
e) The identity element of addition is ____. The identity element of multiplication is ____.
f) Like terms are terms with the _____ variables raised to the _____ exponents.
g) Only _____ terms can be combined.
h) The numerical coefficient of the term $-7xy^2$ is _____.

17. Complete each statement to illustrate the indicated property.

a) $5x+9y=$ _____ $commutative\ property$ b) $-5\cdot 7=$ _____ $commutative\ property$

c) $5(9r)=$ _____ $associative\ property$ d) $-4+(12+8)=$ _____ $associative\ property$

e) $9y - 6y =$ _____ $distributive\ property$

f) $8(-4 + x) =$ _____ $distributive\ property$

g) $-\frac{1}{4}ty + \frac{1}{4}ty =$ _____ $additive\ inverse\ property$

h) $-\frac{9}{8}\left(-\frac{8}{9}\right) =$ _____ $multiplicative\ inverse\ property$

18. Use the **distributive property** to evaluate each expression **mentally**.

a) $27 \cdot 60 + 27 \cdot 40$

b) $58 \cdot \frac{3}{2} - 8 \cdot \frac{3}{2}$

19. Simplify.

a) $7\{-7 + 8[5 - 3(4 + 6)]\}$

b) $3\{[6(x - 4) + 5^2] - 2[5(x + 8) - 10^2]\}$

c) $\{x + [f - (f + x)] + [x - f]\} + 3x$

d) $2(-2x^2 + 1) - 4(x^2 - 3) + x^2$

20. Insert one pair of parentheses to make the statement true.

a) $3 - 8^2 + 9 = 34$

b) $2 \cdot 7 + 3^2 \cdot 5 = 104$

21. *Investigation:*

For each integer n determine which of the expressions $\frac{2}{n}, n - 2$, and $2 - n$ has the largest value.