Name _____   Date_____

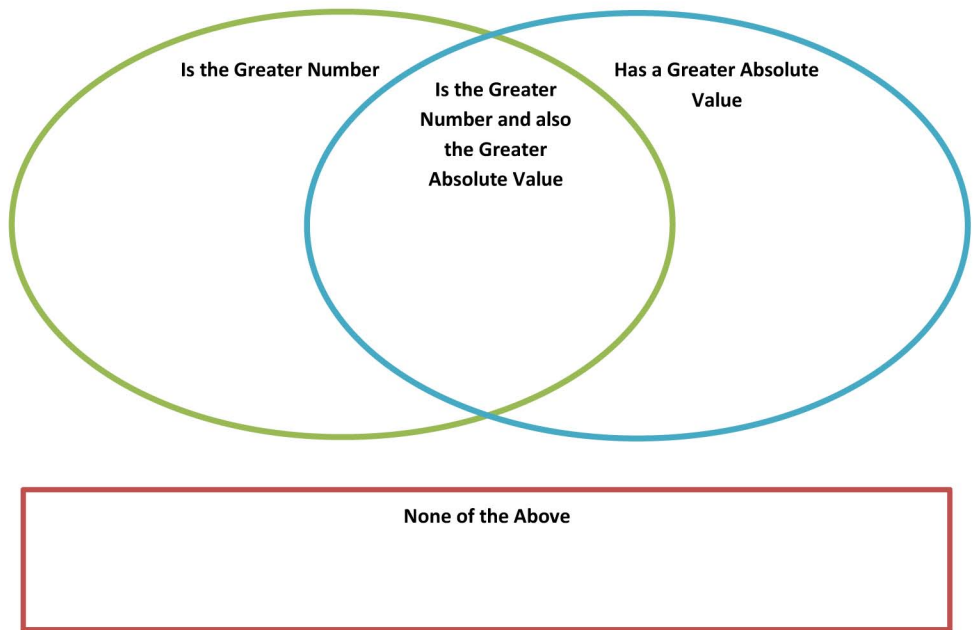# The Relationship Between Absolute Value and Order

1. Bethany writes a set of rational numbers in increasing order. Her teacher asks her to write the absolute values of these numbers in increasing order. When her teacher checks Bethany's work, she is pleased to see that Bethany has not changed the order of her numbers. Why is this?

2. Mason was ordering the following rational numbers in math class: $-3.3, \ -15, \ -8\frac{8}{9}.$

   a. Order the numbers from least to greatest.

   b. List the order of their absolute values from least to greatest.

   c. Explain why the orderings in parts (a) and (b) are different.

1. Micah and Joel each have a set of five rational numbers. Although their sets are not the same, their sets of numbers have absolute values that are the same. Show an example of what Micah and Joel could have for numbers. Give the sets in order and the absolute values in order.

   Enrichment Extension: Show an example where Micah and Joel both have positive and negative numbers.

2. For each pair of rational numbers below, place each number in the Venn diagram based on how it compares to the other.

   a. $-4, -8$
   b. $4, 8$
   c. $7, -3$
   d. $-9, 2$
   e. $6, 1$
   f. $-5, 5$
   g. $-2, 0$

   Is the Greater Number

   Is the Greater Number and also the Greater Absolute Value

   Has a Greater Absolute Value

   None of the Above

1. Bethany writes a set of rational numbers in increasing order. Her teacher asks her to write the absolute values of these numbers in increasing order. When her teacher checks Bethany's work, she is pleased to see that Bethany has not changed the order of her numbers. Why is this?

   All of Bethany's rational numbers are positive or 0. The positive rational numbers have the same order as their absolute values. If any of Bethany's rational numbers are negative then the order would be different.

2. Mason was ordering the following rational numbers in math class: $-3.3, \ -15, \ -8\frac{8}{9}$.

   a. Order the numbers from least to greatest.

   $-15, \ -8\frac{8}{9}, \ -3.3$

   b. List the order of their absolute values from least to greatest.

   $3.3, \ \frac{8}{9}, \ 15$

   c. Explain why the orderings in parts (a) and (b) are different.

   Since these are all negative numbers, when I ordered them from least to greatest, the one farthest away from zero (farthest to the left on the number line) came first. This number is -15. Absolute value is the numbers' distance from zero, and so the number farthest away from zero has the greatest absolute value, so 15 will be greatest in the list of absolute values, and so on.

---

1. Micah and Joel each have a set of five rational numbers. Although their sets are not the same, their sets of numbers have absolute values that are the same. Show an example of what Micah and Joel could have for numbers. Give the sets in order and the absolute values in order.

   Examples may vary. If Micah had $1, \ 2, \ 3, \ 4, \ 5$, then his order of absolute values would be the same: $1, 2, \ 3, \ 4, \ 5$. If Joel had the numbers $-5, \ -4, \ -3, \ -2, \ -1$, then his order of absolute values would also be $1, \ 2, \ 3, \ 4, \ 5$.

   Enrichment Extension: Show an example where Micah and Joel both have positive and negative numbers.

   If Micah had the numbers: $-5, \ -3, \ -1, \ 2, \ 4$, his order of absolute values would be $1, \ 2, \ 3, \ 4, \ 5$. If Joel had the numbers $-4, \ -2, \ 1, \ 3, \ 5$, then the order of his absolute values would also be $1, \ 2, \ 3, \ 4, \ 5$.

2. For each pair of rational numbers below, place each number in the Venn diagram based on how it compares to the other.

a. $-4, -8$

b. $4, 8$

c. $7, -3$

d. $-9, 2$

e. $6, 1$

f. $-5, 5$

g. $-2, 0$

Is the Greater Number

-4

2 0

5

Is the Greater Number and also the Greater Absolute Value

8

7

6

Has a Greater Absolute Value

-8

-9

-2

None of the Above

4 -3 1 -5