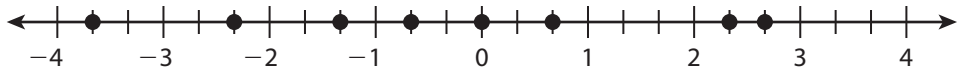
Comparing Clues

Your Challenge

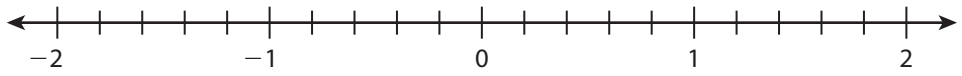
➤ **Your friend writes clues about points on two number lines. Read the clues about each number line, and label the points on the number lines.**

1. Use the clues to label the points on the number line.



- $a < b$
- b is the opposite of c
- c is a positive number and $c < e$
- $d > e$
- e is the opposite of f
- f is the opposite of $2\frac{1}{3}$
- g is halfway between 4 and -4
- $h < a$

2. Use the clues to plot and label possible positions of the points on the number line.



- $q > z$ and $q < y$
- r is the opposite of s
- $s < z$
- $t > s$ and $t > w$
- w is neither negative nor positive
- $x < t$ and $x > w$
- $y > -0.8$ and $y < w$
- z is the opposite of 1.4

Absolutely True

Your Challenge

How can you use a spreadsheet program to determine if an inequality is true or false?

➤ **Use spreadsheet technology to test whether absolute value inequalities are true.***

a. Open a spreadsheet program on a computer.

b. Label Column A "Number." Label Column B "Absolute Value."

c. Enter the numbers 1–3 and their opposites in Column A. Write only one number per cell.

d. Use a formula to find the absolute value of each number you wrote in Column A. Enter the formulas in Column B. Use the formula =ABS(number). Replace the word "number" with the cell number to the left. For example, to find the absolute value of 1, which is in cell A2, write "=ABS(A2)". Now when you change the numbers in Column A, the values in Column B will automatically update.

e. To see each absolute value formula you wrote in Column B, go to the Formulas tab and select "Show Formulas" to turn the formulas on. When you select "Show Formulas" again to turn the formulas off, it will revert to showing the numbers.

1. What do you notice about the absolute values in Column B?

f. Label Column C "Inequalities." Click on the Formulas tab, and select "Show Formulas" to turn the formulas on. Then write some inequality formulas, making sure to include an equal sign before each inequality. For example, $= -2 < 1$ or $= -2 > 3$. When you click on "Show Formulas" again to turn the formulas off, the program will tell you if your inequalities are true or false.

g. To write an absolute value inequality, use the formula =ABS(number)> ABS(number). Replace the word "number" with the actual number you want to find the absolute value of. You may use >, <, or = to write your statement. Then use "Show Formulas" to show whether the statement is true or false.

*** You may need to adjust the steps depending on which spreadsheet program you use. If needed, use Help or Support menus or online tutorials.**

Absolutely True

h. Use formulas in the spreadsheet to test out inequalities and answer each problem. In the problems below, *a* and *b* represent numbers. Try out different values for *a* and *b* to find when each situation is true.

2 Describe a situation in which $a < b$ and $|a| > |b|$. Give an example.

3 Describe a situation in which $a > b$ and $|a| < |b|$. Give an example.

4 Describe a situation in which $a < b$ and $|a| = |b|$. Give an example.

5 Describe a situation in which $a > b$ and $|a| = |b|$. Give an example.