NMP II CONTENT TEST NUMBER SYSTEM 7th GRADE
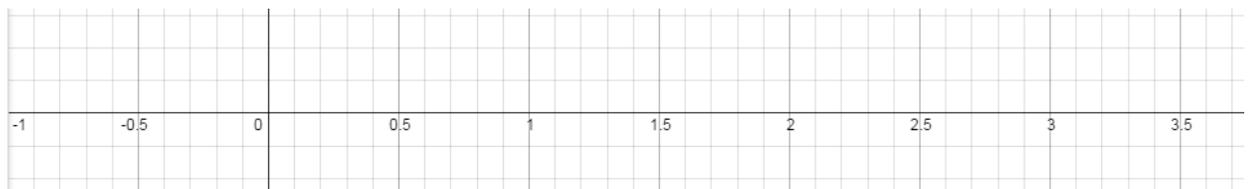
1. Suppose that p=5 and q=3.
   (a) Locate and label p and q on the number line.
   (b) Locate p-q on the number line and label this X.
   (c) What is the distance from p to q?
   (d) What is the distance from p to X?
   (e) What is the distance from q to X?
   (f) Locate q-p on the number line and label this Y.
   (g) Find the distance from p to Y and q to Y.
   (h) Repeat (a)-(g) for p=4 and q=-2.
   (i) Repeat (a)-(g) for p=$\frac{9}{2}$, and q=-$\frac{1}{3}$

2. Consider the following two collections of numbers:

A={1,3,5,7,9} and B={-2,-4,-6,-8,-10}

If you take a number from A times a number from B which of the following are true?
(Choose all that are correct)

(a) The answer will always be even
(b) The answer will always be odd
(c) Sometimes the answer will be even and sometimes the answer will be odd.
(d) The answer will always be positive
(e) The answer will always be negative
(f) Sometimes the answer will be positive and sometimes the answer will be negative.
(g) The smallest possible answer is -2. (If you disagree state what the smallest product is)
(h) The largest possible answer is -2. (If you disagree state what the largest product is)
(i) Repeat (a)-(h) in the case where both numbers are different but from A.
(j) Repeat (a)-(h) in the case where both numbers are different but from B.
(k) Repeat (d)-(h) where we take a number in A divided by a number in B.
(l) Repeat (d)-(h) where we take a number in A divided by another number in A.
(m) Repeat (d)-(h) where we take a number in B divided by another number in B.

3. For each of the following fractions determine the decimal equivalent. In some cases these will be terminating decimals and in other cases repeating decimals. Indicate the first time the repeating portion occurs so for example we write $\frac{1}{3} = 0.\overline{3}$ rather than $\frac{1}{3} = 0.3\overline{3}$ or $\frac{1}{3} = 0.\overline{33}$. Of course these are all valid but for this problem we want you to analyze how and where the repetition initiates.

   (a) $\frac{7}{20}$

   (b) $\frac{20}{7}$

   (c) $\frac{3}{11}$

   (d) $\frac{14}{45}$

   (e) $\frac{4115}{33333}$

4. Can you find rational numbers whose decimal equivalents satisfy the following? Express all answers as a fraction of positive integers which is in lowest terms.

   (a) The decimal has the form $0.abc\overline{0}$ where a,b,c are all different from the set $\{1,2,3,4,5,6,7,8,9\}$.

   (b) The decimal has the form $0.abc\overline{3}$ where a,b,c are all different from the set $\{0,1,2,4,5,6,7,8,9\}$.

5. It is known that $\frac{1}{11} = 0.\overline{09}$. So what is the decimal equivalent of $\frac{9}{11}$? Explain how you did this without going through long division. What about $\frac{20}{11}$?