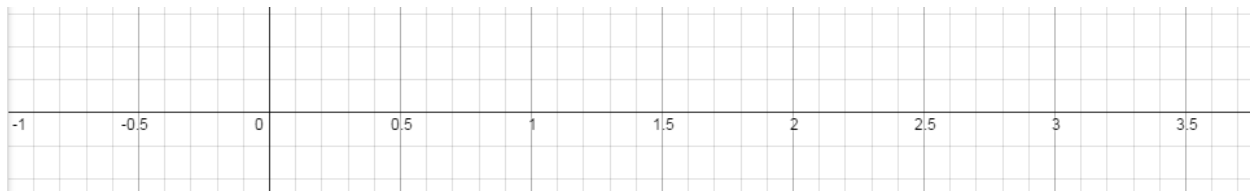


## NMP II CONTENT TEST NUMBER SYSTEM 6<sup>th</sup> GRADE

1. Bob has  $\frac{6}{7}$  cups of grape drink. If it takes  $\frac{1}{3}$  of a cup for each batch of summer candy, then how many batches and fractions of batches of candy can Bob make? Here we assume he has whatever he needs of the other ingredients. Illustrate your reasoning.

2. Jill is milking her cow Bessie. Her mom needs 3 cups of Bessie's milk to make Nevada cheese. So far, Jill has obtained  $\frac{9}{7}$  cups of milk. On the number line below, indicate both the amount of milk Jill has and the amount of milk she needs. Be as accurate as possible and label which mark is which.



3. Fraction project: Illustrate the reason for each answer

(a) Which is larger,  $\frac{2}{3}$  or  $\frac{3}{4}$ ?

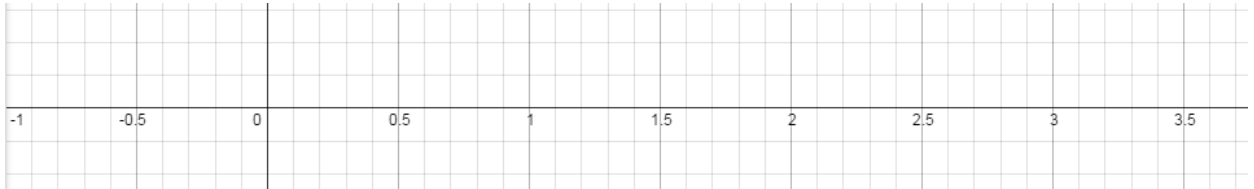
(b) What is  $\frac{2}{3} \div \frac{3}{4}$ ?

(c) What is  $\frac{3}{4} \div \frac{2}{3}$ ?

(d) Using the answers to parts (b) and (c), compute the larger answer minus the smaller answer. Explain fully.

4. Order the following from smallest to largest and then compute each answer.
- (a)  $124 \times 34.2$
  
  - (b)  $124 \div 34.2$
  
  - (c)  $124 - 34.2$
  
  - (d)  $124 + 34.2$
5. Consider the numbers 11,15,21, and 35. Fully explain your answers!
- (a) Find two of these numbers whose least common multiple is the product of the numbers. State the numbers and their least common multiple.
  
  - (b) Find two of these numbers whose least common multiple is not the product of the numbers. State the numbers and their least common multiple.
  
  - (c) Find two of these numbers whose greatest common factor is 1. State the numbers and their greatest common factor.
  
  - (d) Find two of these numbers whose greatest common factor is greater than 1. State the numbers and their greatest common factor.
  
  - (e) Express  $21+35$  in the form  $a(b+c)$  where the greatest common factor of  $b$  and  $c$  is 1. What is the greatest common factor of?

6. Consider the numbers  $-\frac{2}{3}$ ,  $\frac{3}{5}$ ,  $\frac{5}{7}$ , and  $-\frac{7}{11}$ . Compute all possible products of any two of these numbers and denote your answers on the number line below. How many of your answers are positive and how many are negative?



7. Determine the unknown value of  $\bigcirc$  for each of the following. In some cases there is no solution so indicate this.

(a)  $\frac{4}{7} \times \bigcirc = 1$

(b)  $\frac{4}{7} \times \bigcirc = 0$

(c)  $\frac{4}{7} + \bigcirc = 1$

(d)  $\frac{4}{7} + \bigcirc = 0$

(e)  $\frac{4}{7} \div \bigcirc = 1$

(f)  $\frac{4}{7} \div \bigcirc = 0$

(g)  $\frac{4}{7} - \bigcirc = 1$

(h)  $\frac{4}{7} - \bigcirc = 0$

8. Determine which numbers  $p$  satisfy each of the following:

(a)  $-p$  is negative

(b)  $-p$  is positive

(c)  $-p^2$  is negative

(d)  $-p^2$  is positive

(e)  $(-p)^2$  is positive

(f)  $(-p)^2$  is negative

9. Consider the numbers  $\{2,3,5,0,-4,-7,-1\}$ .

(a) Order these numbers from smallest to largest.

(b) Find the absolute value of each number.

(c) Order the absolute values of these numbers from smallest to largest.

(d) Give an example of two numbers which are not equal but have the same absolute value. On the number line what number is exactly halfway between these two numbers?

10. Plot each of the points specified below on the coordinate axes provided. Be sure to label each point.

$A(3,5)$ ,  $B(-3,5)$ ,  $C(3,-5)$ ,  $D(-3,-5)$ ,  $E(\frac{5}{3}, -\frac{3}{5})$ ,  $F(\frac{3}{5}, -\frac{5}{3})$ ,  $G(-\frac{3}{5}, -\frac{5}{3})$ ,  $H(-\frac{5}{3}, -\frac{5}{3})$

(a) Which pairs of points belong to the same horizontal line? For each such pair determine how far apart the points are.

(b) Which pairs of points belong to the same vertical line? For each such pair determine how far apart the points are.

(c) Specify 4 points (none of them in the list above) which are all precisely 2 units away from point E. In addition to determining the coordinates of your points, give them letter names and also plot them on the axes with the others.

