1. Consider the set of odd natural numbers. Answer the following with true or false AND illustrate the reason for your answer by giving an example, counterexample, or explanation.
   a) The set is closed with addition
   b) There is an addition identity.
   c) The set is closed with multiplication.
   d) The set is dense.
   e) Multiplication will distribute over addition.
   f) Addition is commutative.
   g) There is a multiplication identity.
   h) No odd natural numbers are divisible by 6.

2. Answer the following:
   a) What is the LCM(8, 16, 24, 28)?
   b) What is the GCF(102, 187, 340)?
   c) What is the sum of the consecutive natural numbers from 1 to 17?
d) What is the next number in the sequence: 3, 7, 17, 33, 55, 83, 117?

e) How many subsets you can be made from a universal set of 4 elements?

3. Insert the correct relational operator ( <, > or =) to make the statements true:

   a) \( \frac{4}{7} \quad \frac{5}{9} \)
   
   b) \( \frac{3}{4} \quad \frac{1}{2} \)

   c) \( \frac{16}{20} \quad 0.8 \)
   
   d) \( 0.11 \quad \frac{1}{9} \)

4. Use the number lines below to illustrate the given operation:

   a) Addition of \( +3 \) and \( -2 \)

   ```
   -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8
   ```

   b) Subtraction of \( +3 \) from \( -2 \)

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   -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8
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5. Answer the following.

   a) Why can’t we divide by zero?

   b) List two operations we can use to compare numbers and illustrate how that comparison makes sense.
c) What term do we usually associate with the multiplication of both sides of an equation by the LCM of both sides?

d) What term do we usually associate with the application of the commutative property of multiplication when reducing common fractions?

e) Write two (2) decimal fractions equivalent to $\frac{3}{4}$.

f) Name an ancient numeration system which was based on powers of ten?

g) Name an ancient numeration system which was a positional, placed-valued system based on 60?

h) How did ancient Egyptians write common fractions?

i) How did ancient Babylonians write “decimal” fractions?

6. Find a rational number equidistant from $\frac{3}{5}$ and $0.59\bar{9}$

7. In one elementary school class the following information on sports preferences was obtained: 7 liked tennis; 11 liked baseball; 9 liked soccer; 5 liked tennis and baseball; 3 liked baseball and soccer; 2 liked tennis and soccer; and 2 liked all three sports. How many students were there in this class and how many liked either tennis or soccer?
8. Evaluate each of the following:

a) \(95 \frac{2}{15} - 88 \frac{5}{6}\)  
b) \(5 \frac{7}{8} + 4 \frac{1}{6} + 6 \frac{1}{3} + 3 \frac{1}{4}\)

c) \(4 \frac{1}{2} \times 2 \frac{5}{6}\)  
d) \(2 \frac{1}{2} \div 3 \frac{1}{3}\)

e) Half of 0.1  
f) The slope of the line between the points \(<2, 1>\) and \(<3, 10>\)

9. The following figure shows a row of 5 toothpick houses.

![Toothpick houses diagram]

a) How many toothpicks will be required to build a row of 80 such toothpick houses?

b) How many such toothpick houses can be built, if 500 toothpicks are available?

11. Find an appropriate MagiMixer expression
12. The following problem is from the *Mathematics in Context* program developed for middle school students by the University of Wisconsin and Encyclopedia Britannica. (For more information see my resources web page.)

- Find the cost of each umbrella and each hat from the figure below.
  Two hats and an umbrella cost $76.00 while two umbrellas and one hat cost $80.00.

****  Bonus  ****

It has been said that a “teacher is someone who lights up dark places”.

What per cent of the words in the quotation have contain more than one vowel?