Name_____ Date_____

Density, Limits, and Infinity Answers

1. There is an infinite number of numbers between $\frac{1}{5}$ and $\frac{2}{5}$. I know this because I can find equivalent fractions for $\frac{1}{5}$ and $\frac{2}{5}$, such as $\frac{100}{500}$ and $\frac{200}{500}$. I can keep finding equivalent fractions with larger denominators, so there are more fractions between them. It is endless how large the denominator can be.

2. a) The even numbers between 0 and 100 are 2, 4, 6, ..., 98. There are 49 even numbers, so the density is 49.

   b) There is an infinite number of real numbers between 0 and 100. I know this because the real numbers include decimals and fractions, which can be infinitely small.

   c) The set of real numbers between 0 and 100 has more than 49 numbers, so it is more dense than the set of even numbers between 0 and 100.

3. a) The limit is 9.

   b) The limit is 72.

   c) The limit is 0.

4. For example, 2.9, 2.99, 2.999, ...; 3.9, 3.09, 3.009, …; $2\frac{3}{4}, 2\frac{4}{5}, 2\frac{5}{6}, ...$