Real Numbers Worksheet I   Name:_____

MA 201

1. Convert the following fractions to decimals. Note that the prime power representations of each denominator contain only 2's and/or 5's.

   (a) $\dfrac{7}{40}$

   (b) $\dfrac{11}{8}$

   (c) $\dfrac{23}{25}$

2. Classify each decimal according to the following categories

   - terminating decimal or nonterminating decimals
   - repeating decimal or non-repeating decimal

   (a) 123.123

   (b) 45.4545

   (c) 0.101001000100001...

   (d) 0.10101010...

   (e) 0.9999...

   (f) $5.\overline{67}$

   (g) 67.1243636

3. Convert the following decimals to fractions, if possible.

   (a) 123.123

   (b) 45.4545

   (c) 0.101001000100001...

   (d) 0.10101010...

   (e) 0.9999...

   (f) $5.\overline{67}$

   (g) $5.\overline{675}$

   (h) $5.\overline{67234}$

   (i) 67.1243636

4. Objective number 48 should say:
   Know that every terminating decimal is a rational number, that is, every terminating decimal can be expressed as a fraction.
   You need to remove the word "repeating"

5. Know that every nonterminating, repeating decimal is a rational number, that is, every nonterminating, repeating decimal can be expressed as a fraction.

6. Know that every nonterminating, non-repeating decimal is a NOT rational number, that is, every nonterminating, non-repeating decimal CANNOT be expressed as a fraction.

7. Show that $\sqrt{2}$ is irrational.

8. Show that $3\sqrt{2}$ is irrational.

9. Show that $5 + \sqrt{2}$ is irrational.

10. Know that there are infinitely many irrational numbers.

11. Know that every position on the number line represents a real number and every real number is represented by a position on the number line.

12. Know that there are positions on the number line which do not represent rational numbers.