NAME: _____ DATE: _____

REAL NUMBERS: UNIT PRACTICE TEST

1) Fill in the blanks

a) To change a fraction to a decimal, you need to divide the _____ by the _____.

b) Dividing an integer by 0, as in $\frac{11}{0}$, is _____.

c) $7.\overline{41}$ is an example of a _____ decimal.

d) Give an example of a rational number that is equivalent to – ¼. _____

e) A number that can be written as a fraction where **a** and **b** are integers and $b \neq 0$ is a _____ number.

f) The decimal form of $\frac{5}{9}$ is _____. This is an example of a _____ decimal.

g) Non-repeating and non-terminating decimals are known as _____numbers.

SOME KEY TERMS (*Word Bank*): Note that some words in the bank will not be used in the blanks above!

repeating, numerator, add, subtract, multiply, divide, length, impossible, common denominator, terminating, denominator, irrational, rational.

2) State whether True or False.

i. Every integer is a rational number.
ii. Every integer is a whole number.
iii. $\sqrt{-25}$ is irrational.
iv. Uncountable infinities are the same as countable infinities.
v. Countable infinities are those sets which can be listed out.
vi. An infinity is not a number but an idea of going on forever.
vi. Rational Numbers are uncountable infinities.
vii. The set of real numbers is a countable infinity.

3) Multiple Choice Questions.

i. What number sets does –⅕ belong to?
   a) –⅕ is an integer, rational, and real
   b) –⅕ is not an integer, but it is rational and real
   c) –⅕ is a non-integer, irrational, and real
   d) –⅕ is an integer, irrational, and real
   d) –⅕ is a non-integer, irrational, and non-real

ii. Which of the following is an integer?
   a) 1.5
   b) ⅓
   c) π
   d) –8
   e) None of these are integers
   f) Two of these are integers

iii. What type of infinity would it be if you were to try to write down all of the prime numbers?
   a. A countable infinity
   b. An uncountable infinity
   c. Neither

iv. Calculate the following: $5 + \aleph_0$
   a. $\aleph_0$
   b. A finite number
   c. An uncountable infinity

Knowledge & Understanding

1) Write each of the following in decimal form.

a) $\left(\frac{-3}{5}\right)$ = b) $\frac{5}{8}$ = c) $-2\frac{1}{3}$ =

2) Express in fractional form $\frac{a}{b}$ **in lowest terms**.

b) 0.25 = b) 3.3 = c) –0.8 =

3) Fill in the chart below, stating the period and length for each rational number.

Rational Number	Decimal Form	Percent
$\frac{-1}{3}$		
		14%
	2.45	

4) Simplify each expression. Express in lowest terms and show your work.

a) $\frac{-2}{3}\left(\frac{-4}{9}+\frac{8}{9}\right)$

=

b) $\frac{-11}{5}\left(\frac{-6}{5}\div 3\right)$

=

c) $\left(\frac{5}{6}\div\frac{-10}{3}\right)+\left(\frac{3}{4}\times\frac{1}{-2}\right)$

=

5) Simplify each expression. Be sure to follow the order-of-operations.

a) $-12.2 - 26.6 \div 0.2$

=

b) $\left(\frac{-2}{3}\right)^2 + \frac{5}{9}$

=

6) Write the reciprocal, *in lowest terms*, for each of the following rational numbers.

a) $\frac{2}{3}$ b) $\frac{-12}{4}$ c) $\frac{21}{5}$ d) -3

7) Evaluate the following powers:

a) 3^4 b) 9^0 c) 2^{-1} d) $\left(\frac{4}{7}\right)^3$

e) $(2^3 - 3^2) + (5^2 - 4^3)$

8) Convert to Scientific Notation:

a) 85473200856 b) 0.0000000000000000342

9) Write the full number from the scientific notation:

a) 3.21×10^{-7} b) 8.05×10^{3}

Application

1) Solve each of the expressions. $a = \frac{1}{3}$, $b = \frac{-2}{5}$, and $c = \frac{0}{7}$.

a) $a \div b$ = b) $(a - b) + c$ = c) abc =

2) The value of shares of one stock were watched for 4 days. At the beginning of a week, the value of a share of Groove Music was $\$7.35$. During the next four days, the value went up $\$0.75$, down $\$0.63$, down $\$0.50$, and up $\$0.25$. What was the value of the stock at the end of the week? **(Show your work and make sure you write a concluding sentence.)**

3) Andrew wants to serve $\frac{1}{4}L$ of milk with each meal. If he has $3\frac{1}{4}L$ of milk, how many meals can he serve? **(Show your work and make sure you write a concluding sentence.)**

The Infinite hospitality problem

You are the owner of an infinite hotel, which has infinite number of rooms, labelled room 1, room 2, room 3, etc…
One day two vehicles looking for shelter pulled up in front of the hotel: two passengers in a Volkswagen + an infinite bus full of infinite passengers, each with seats numbered seat 1, seat 2, seat 3, seat 4, …….. No one wants to share a room. What instruction will you give the passengers in the Volkwagen and the bus riders to assign every person on the bus a room in your hotel?

Answers will be posted in Edsby later in the day. Compare with classmates as well.