

### Rational Number Conversions

1. Convert the following fractions to decimal form. (Recall: Fraction bar means \_\_\_\_\_)

For just this question, use a calculator – may use phone or chromebook if you have no regular calculator.

a)  $\frac{5}{8}$

b)  $4\frac{6}{7}$

c)  $2\frac{413}{900}$

**NOTE:** All repeating and terminating decimal numbers are rational numbers (they may be converted to fractions.)

When converted to decimal form, Irrational Numbers neither terminate nor repeat.

Irrational numbers are numbers like:

2. Classify each of the following real numbers as rational ( $Q$ ) or irrational ( $\bar{Q}$ ).

a)  $\pi$

b) 0.4

c)  $-34.\overline{7342}$

d)  $\sqrt{3}$

e) 3.14159

f)  $\sqrt{123}$

g) 0

h) - 14

i)  $\sqrt{9}$

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3. Convert the following numbers to fraction form, if possible.

a) 0.124

b)  $5.\overline{612}$

c)  $\sqrt{15}$

d)  $0.7\overline{8}$

e)  $\sqrt{36}$

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### How to Convert Rational Numbers from Decimal Form to Fraction Form:

A: If there are no repeating decimals, count the number of digits to the right of the decimal – that is the number of zeroes in that place value so that is the power of ten in the denominator. The numerator is the decimal portion of the number.

$$\text{E.g. } 0.39 = \frac{39}{100}$$

B: If the entire decimal portion is repeating, count the number of digits to the right of the decimal, the denominator is a number made up of just nines... the number of 9's corresponds to the number of digits that are repeating.

$$\text{E.g. } 0.\overline{39} = \frac{39}{99} \quad \text{Reduce this to lowest terms } \frac{13}{33}$$

C: If only a portion of the decimal repeats...

The numerator is the entire decimal portion subtract the non-repeating portion, the denominator begins with 9's. The number of 9's corresponds to the number of digits that repeat, the nine are followed by zeroes. The number of zeroes correspond to the number of digits to the right of the decimal that do not repeat.

$$\begin{aligned} \text{E.g. } 0.14\overline{37} &= \frac{1437-14}{9900} \\ &= \frac{1423}{9900} \end{aligned}$$

1432 is not even so not divisible by two,  $1+4+3+2=10$  so not divisible by 5,  $1-4+3-2$  does not equal 0 so not divisible by 11... fraction does not reduce.

Show mathematically why this “trick” (1437-14 is the numerator) works, given knowledge of A and B above.