

Lesson 104: Rats and Irrats

$\sqrt{2}, \pi$ Irrationals: Non-terminating, Non-repeating decimals
Rationals: Terminating or repeating decimals

Rational Number: A number that can be written as a ratio of integers (fraction)

→ Terminating:

a) Show that 0.00348 is rational by writing it as a fraction of integers

$$= \frac{348}{100,000} = \frac{623}{100,000,000}$$

b) 0.00000623 = $\frac{623}{100,000,000}$

→ Repeating:

a) Show that $0.01\overline{623}$ is rational by writing it as a fraction of integers

$$\begin{array}{r} 100N = 1.6\overline{23} \mid 23 \ 23 \ 23 \ \dots \\ - N = 0.01\overline{6} \mid 23 \ 23 \ 23 \ \dots \\ \hline 99N = 1.607 \mid \end{array}$$
$$N = \frac{1.607}{99} \times 1000 = \frac{1,607}{99,000}$$

b.) $1.003\overline{1543}$

$$\begin{array}{r} 1000N = 1003.1\overline{543} \mid 543 \ 543 \ 543 \\ - N = -1.003\overline{1} \mid 543 \ 543 \ 543 \\ \hline 999N = 1002.1512 \end{array}$$
$$N = \frac{1002.1512}{999} = \frac{1,002,1512}{999,000}$$