What makes a number rational?

Rational

A number is **rational** if it can be written as the **ratio** of two integers.

(Integers: Positive and negative whole numbers)

Examples of rational numbers:

Whole Numbers

$2 = \frac{2}{1}$

$26 = \frac{26}{1} = \frac{52}{2}$

$10 = \frac{10}{1}$

$-5 = \frac{-5}{1} = \frac{5}{-1}$

perfect square

$\sqrt{36} = 6 = \frac{6}{1}$

Terminating Decimals

$1.25 = \frac{5}{4} = \frac{125}{100}$

$56.7 = \frac{567}{10}$

$1.5 = \frac{3}{2} = \frac{15}{10}$

$0.25 = \frac{1}{4}$

$2.7 = \frac{27}{10}$

$2.3 = \frac{23}{10}$

$375.3 = \frac{3753}{10}$

$0.9 = \frac{9}{10}$

$12.2 = \frac{61}{5} = \frac{122}{10}$

$0.032 = \frac{32}{1000}$

Repeating Decimals

$.\overline{44} = \frac{4}{9}$ $.\overline{66} = \frac{2}{3}$ $.\overline{81} = \frac{9}{11}$

$.\overline{36} = \frac{4}{11}$ $.\overline{125} = \frac{125}{999}$

Irrational Numbers

π $\sqrt{17}$ $\sqrt{21}$

4.7894... $\sqrt{11}$ $\sqrt{2}$

$\sqrt[3]{15}$ $\sqrt{15}$

Rational or not?

$\frac{2}{7}$

Y

3π

N

$\sqrt{20}$

N

$\sqrt{20+5}$

Y

$\frac{5}{1}$

$-\sqrt{144}$

Y

$\frac{-12}{1}$

-5.65

Y

$\frac{-565}{100}$