Rational v. irrational numbers

Rational Numbers

Definition

A RATIONAL NUMBER IS ANY NUMBER THAT CAN BE WRITTEN AS A FRACTION (QUOTIENT) $\frac{p}{q}$ WHERE p AND q ARE INTEGERS AND q IS NON ZERO

Examples

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Why?
- IT IS A WHOLE NUMBER
- $\frac{5}{1}$

0.25

Why?
- CAN BE WRITTEN AS $\frac{1}{4}$

$\sqrt{9}$

Why?

$\sqrt{9} = 3$

3 IS A WHOLE NUMBER

$\frac{3}{1}$

$-\frac{2}{3}$

Why?
- NEGATIVES ARE STILL RATIONAL AND IT ALREADY IS $\frac{a}{b}\left(\frac{p}{q}\right)$

Irrational Numbers

Definition

A NUMBER THAT CANNOT BE WRITTEN AS $\frac{p}{q}$

OR IN OTHER WORDS, ANY NUMBER THAT IS NOT RATIONAL

Examples

$\sqrt{10}$

Why?

$\sqrt{10} \approx 3.162\,28\ldots$

IT CANNOT BE WRITTEN AS A FRACTION

π

Why?

$\pi = 3.1416\ldots$

IT IS A REPEATING DECIMAL THAT CANNOT BE WRITTEN AS A FRACTION

Estimating on a number line with rational and irrational numbers.

THE BEST WAY TO ORDER ANY SET OF NUMBERS (INTEGERS, FRACTIONS, SQUARE ROOTS, ETC.) IS TO FIND THE APPROXIMATE DECIMAL FORM AND COMPARE THEM ALL AS DECIMALS

For each of the values below, determine their approximate decimal value rounded to the nearest tenth. Determine if the number is rational or irrational and then place it on the number line.

Value	Decimal to tenths spot	Rational or Irrational?
$-4\frac{1}{2}$	-4.5	RATIONAL
π	3.1	IRRATIONAL
$\sqrt{16}$	4	RATIONAL
$\sqrt{12}$	3.5	IRRATIONAL
$\sqrt{9}+\sqrt{4}$	5	RATIONAL
~~$\sqrt{25}+\sqrt{3}$~~ $\sqrt{9}$	~~4,7~~	IRRATIONAL
-0.25	-0.25	RATIONAL