1.1 Intro to Rational Numbers

Introduction to Rational Numbers

The set of real numbers is made up of rational and irrational numbers. **A rational number is any number that can be expressed as a fraction.**

Rational Numbers	Irrational Numbers
5 $-\frac{1}{8}$ $3\frac{7}{8}$ 0.007 0 -4 -12 -1.3 $3.\overline{7}$ $\sqrt{9}$	π $-\sqrt{17}$ $\sqrt{2}$ $0.12834...$ *decimals without an "end" and not repeating

Example 1: Comparing rational numbers.

Which rational number is greater, $\frac{7}{16}$ or $\frac{5}{8}$?

* write fractions with a common denominator

$\frac{10}{16}$ ← 5×2 ← 8×2

$\frac{7}{16} < \frac{5}{8}$

($\frac{5}{8}$ is the greater number)

Which rational number is smaller, $\frac{5}{9}$ or $\frac{3}{8}$?

×8 ×8   ×9 ×9

$\frac{40}{72}$ $\frac{27}{72}$

$\frac{5}{9} > \frac{3}{8}$

$\frac{3}{8}$ is smaller

Example 2: Identifying rational numbers between two given numbers.

Identify a fraction between -0.6 and -0.7.

* identify a decimal between -0.6 and -0.7

$-0.65 = \frac{-65}{100} \div 5 = \frac{-13}{20}$

Identify a fraction between -2.4 and -2.5.

$-2.45 = -2\frac{45}{100} \div 5 = -2\frac{9}{20}$

$-2\frac{9}{20} = -\frac{49}{20}$

Example 3: The square of a rational number.

Calculate the square of 2.6.

$2.6^2 = 2.6 \times 2.6 = 6.76$

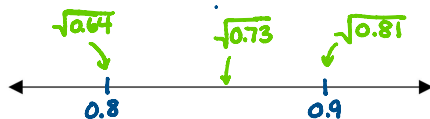$\begin{array}{r} 2.6 \\ \times\ 2.6 \\ \hline 156 \\ 520 \\ \hline 6.76 \end{array}$

Calculate the square of 7.1.

$7.1^2 = 50.41$

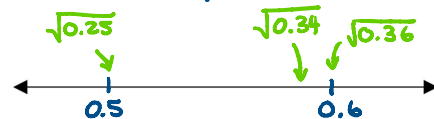$\begin{array}{r} 7.1 \\ \times\ 7.1 \\ \hline 71 \\ 4970 \\ \hline 50.41 \end{array}$

Example 4: The square root of a rational number.

Estimate $\sqrt{0.73}$.

$\sqrt{0.64} = 0.8$ $\sqrt{0.81} = 0.9$

$\sqrt{0.64}$ $\sqrt{0.73}$ $\sqrt{0.81}$

0.8   0.9

$\sqrt{0.73} \approx 0.86$

Estimate $\sqrt{0.34}$.

$\sqrt{0.36} = 0.6$ $\sqrt{0.25} = 0.5$

$\sqrt{0.25}$ $\sqrt{0.34}$ $\sqrt{0.36}$

0.5   0.6

$\sqrt{0.34} \approx 0.59$