Daily Quiz

Simplify

a) $2\sqrt{32}$

$2\sqrt{16 \cdot 2}$

$2 \cdot 4\sqrt{2}$

$8\sqrt{2}$

b) $\left(2x^{-3}y\right)^2$

$2^2 x^{-6} y^2$

$4x^{-6}y^2$

$\frac{4y^2}{x^6}$

Rational Vs. Irrational

objective: Decompose the real # system into parts to see the difference between sets of #'s.

-Identify subsets of the real # system

- Sort rational & irrational #'s

Vocabulary

Set	A collection of objects.
Set Notation	{ }
Natural numbers	Counting numbers {1,2,3, …}
Whole Numbers	Natural numbers and 0. {0,1,2,3, …}
Integers	Positive and negative natural numbers and zero {… -2, -1, 0, 1, 2, 3, …}
Rational Number	A real number that can be expressed as a ratio of integers (fraction)
Irrational Number	Any real number that is not rational. $(\sqrt{2}, \pi)$
Real Numbers	All numbers associated with the number line.

Rational Numbers

- A rational number is a real number that can be written as a ratio of two integers. $\frac{a}{b}$
- A rational number written in decimal form is terminating or repeating.

EXAMPLES OF RATIONAL NUMBERS

- 16 → $\frac{16}{1}$
- 1/2
- 3.56
- -8 = $\frac{-8}{1}$
- 1.3333…
- -3/4

Irrational Numbers

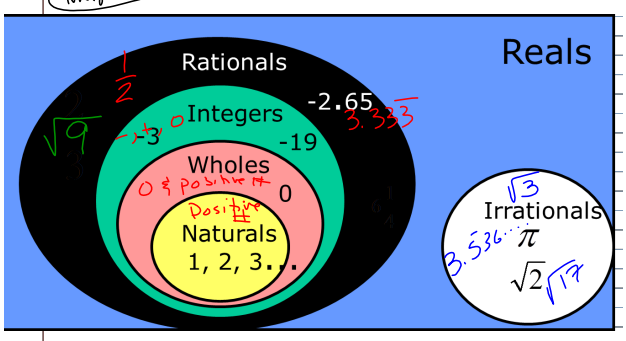
- An irrational number is a number that cannot be written as a ratio of two integers. ~~$\frac{a}{b}$~~
- Irrational numbers written as decimals are non-terminating and non-repeating.
- Square roots of non-perfect "squares" $\sqrt{17}$
- Pi- π

Caution!

A repeating decimal may not appear to repeat on a calculator, because calculators show a finite number of digits.

Make a Venn Diagram that displays the following sets of numbers

Reals, Rationals, Irrationals, Integers, Wholes, and Naturals.



A fraction with a denominator of 0 is undefined because you cannot divide by zero. So it is not a number at all.

$\frac{35}{0}$ = undefined

Additional Example 1: Classifying Real Numbers

Write all classifications that apply to each number

A. $\sqrt{5}$ *5 is a whole number that is not a perfect square.*

irrational, real

B. −12.75 *−12.75 is a terminating decimal.*

rational, real

C. $\frac{\sqrt{16}}{2}$ $\frac{\sqrt{16}}{2} = \frac{4}{2} = 2$

Natural, whole, integer, rational, real