Math 8

Our Goal: To learn to approximate square roots

Warm Up: Quiz discussion

Today's homework
- 7.4 Exercises, p.313: 4-22 (evens)
- iready due on Friday

Previous Homework
None

$$\sqrt{36} = 6$$

$$\sqrt{37} =$$

Common sets of numbers.

Natural: The numbers you naturally count with (1, 2, 3, etc)

Whole: The whole numbers are the natural numbers and also 0!

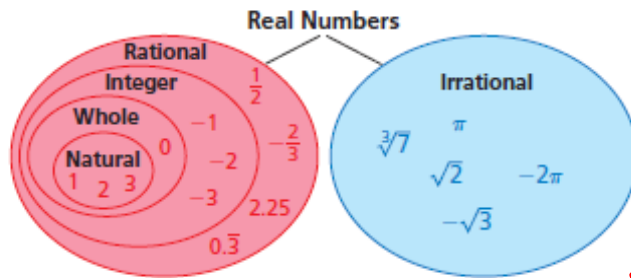Integers: Positive or negative whole #'s (-2, -1, 0, 1, 2, etc)

Rational: Are the ratios of integers (Fraction) Rational #'s are terminating or as a decimal

Irrational: There are some numbers you can't express EXACTLY! (Non-terminating & non-repeating)

Key Idea

Real Numbers

Rational numbers and irrational numbers together form the set of **real numbers**.

Real Numbers

Rational — Integer — Whole — Natural 1 2 3, 0, −1, −2, −3, $\frac{1}{2}$, $-\frac{2}{3}$, 2.25, $0.\overline{3}$

Irrational — $\sqrt[3]{7}$, π, $\sqrt{2}$, -2π, $-\sqrt{3}$

← **NOT a rational number!**

17.2
172/10

(17.2)

$10)\overline{172}$
−10
072
−70
02

Square root of 2 is NOT an integer!

Classify each real number.

Natural

Whole

Integer

Rational

Irrational

	Number	
a.	$\sqrt{12}$	→ 6
b.	$-0.\overline{25}$	→ ?
c.	$-\sqrt{9}$	→ (−3)
d.	$\frac{72}{4}$	→
e.	π	→ 3.14

Classify the <u>real</u> number.

$|+|$ $(+)+)+|$

1. $0.121221222\ldots$ **2.** $-\sqrt{196} = -14$ **3.** $\sqrt[3]{2} = 1.25\ldots$

Irational #   *Rational*   *Irrational*

doesn't   *number*   *number*

term. or end

Estimate $\sqrt{71}$ **to the nearest (a) integer and (b) <u>tenth</u>.**

$\sqrt{64} < \sqrt{71} < \sqrt{81}$

$8 < \sqrt{71} < 9$

The closest is 8

5 or 4 let it

Soar!

$\sqrt{71}$

$= 8.426$

$= 8$

$8.426 = 8.43$ 8.426

$= 8.4$

Estimate the square root to the nearest (a) integer and (b) tenth.

4. $\sqrt{8}$ **5.** $-\sqrt{13}$ **6.** $-\sqrt{24}$ **7.** $\sqrt{110}$

Which is greater, $\sqrt{5}$ or $2\frac{2}{3}$? $\rightarrow$ $\boxed{> =}$

$$\sqrt{5} = 2.23\ldots \quad 2\frac{2}{3}$$

$$2\frac{2}{3}$$

$$2.\overline{6}$$

The radius of a circle with area A is approximately $\sqrt{\dfrac{A}{3}}$. The area of a circular mouse pad is 51 square inches.
<u>Estimate</u> its radius to the <u>nearest integer</u>.

The distance (in nautical miles) you can see with a periscope is $1.17\sqrt{h}$, where h is the height of the periscope above the water. Can you see twice as far with a periscope that is 6 feet above the water than with a periscope that is 3 feet above the water? Explain.

$$d = 1.17\sqrt{h}$$
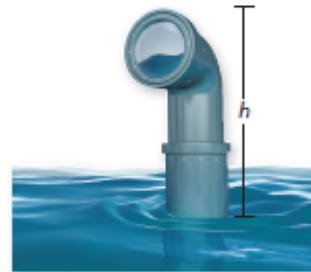
Order the numbers from least to greatest: $\sqrt{38}, \sqrt{\dfrac{100}{3}}, 6.5$