

Main Ideas, Key Points &
 Questions

NOTES

**Irrational
Numbers**

- Irrational Numbers are numbers that are not RATIONAL
- They CAN NOT be written in the form $\frac{a}{b}$. CAN NOT BE A FRACTION
- SQUARE Roots of numbers that are not PERFECT SQUARES are irrational. $\sqrt{3}$ is irrational because 3 is not a PERFECT SQUARE.
- DECIMALS THAT NEVER END AND DO NOT REPEAT

Example

Determine if the following numbers are irrational or rational:

	R	I	I	R	R
1. $\sqrt{25}$	PERFECT SQUARE	2. $\sqrt{50}$	NOT PERFECT SQUARE	3. $\sqrt{2}$	NOT PERFECT SQUARE
				4. 2	WHOLE #

5. $\frac{50}{8}$ WHOLE FRACTION
 6. $\sqrt{\frac{144}{9}}$ or $\frac{\sqrt{144}}{\sqrt{9}}$
 $\sqrt{16} = 4$ WHOLE #

**ESTimating
SQuare
Roots of
Irrational
Numbers**

- To ESTIMATE the square root of a non-perfect square...
- Find two CONSECUTIVE perfect squares that the non-perfect square is in between. ↳ in a row → 1 after another

Ex: Estimate $\sqrt{50}$ → $\sqrt{49}$
 $\sqrt{64}$
 - Take the Square Root of each number.

Ex: $\sqrt{49} = 7$ $(7.1)(7.1) = 50.41$
 $\sqrt{64} = 8$ $(7.2)(7.2) = 51.84$
- So, the $\sqrt{50}$ is in between 7 and 8, or about 7.1.

Example

Estimate the value of each irrational number, then check with a calculator.

$$\begin{array}{lll} 1. \sqrt{5} \rightarrow \sqrt{4} = 2 & 2. \sqrt{3} \rightarrow \sqrt{4} = 1 & 3. \sqrt{10} \rightarrow \sqrt{9} = 3 \\ & \sqrt{9} = 2 & \sqrt{16} = 4 \end{array}$$

GUESS:

$$(2.1)(2.1) = 4.41$$

$$(2.2)(2.2) = 4.84$$

$$(2.3)(2.3) = 5.92$$

2.2 is closest

GUESS:

$$(1.6)(1.6) = 2.56$$

$$(1.7)(1.7) = 2.89$$

$$(1.8)(1.8) = 3.24$$

1.7 is closest

GUESS:

$$(3.1)^2 = 9.61$$

$$(3.2)^2 = 10.24$$

3.2 is closest

1. What is an irrational number?

Summary: A # that can not be written as a fraction

2. Tell if the following numbers are rational or irrational.

a. $\sqrt{27} \rightarrow I$

b. $\frac{2}{27} \rightarrow R$

3. What two perfect squares is 27 between?

25 and 36

4. Estimate the value of $\sqrt{27}$.

between 5 and 6

*5.2