**Ch 1: Rational and Irrational Numbers (Day 4)**

Introduction to Radicals

In math, radicals are roots.

There are square roots 



Cube roots 



Fourth roots 

Etc…

They are all called radicals.



The number under the root sign is called the radicand.



The little number in front of the root sign is called the index.

\* the radicand for a square root is always positive



The following numbers have **square roots** that are natural numbers:



\*We can also take the **square roots** of **decimal** versions of these numbers. The answers will have **half** as many **decimals** as the original value under the radical sign.



\*\*We can also take the **square roots** of **large number** versions. The answers will have **half** the **zeros** as the original value under the radical sign.

Ex:



i)  ii)  iii) 



iv)  v)  vi) 



The following numbers have **cube roots**:



\*Cube roots can be positive or negative!

Because (-)(-)(-)=(-)

Therefore, if the radicand is negative so is its cube root.

\*We can also take the **cube roots** of **decimal** versions of these numbers. The answers will have **1/3rd**  as many **decimals** as the original value under the radical sign.



\*\*We can also take the **cube roots** of **large number** versions. The answers will have **1/3rd** the **zeros** as the original value under the radical sign.

Ex:



i)  ii)  iii) 



iv)  v)  vi) 



\*We can also take the **4th roots** of **decimal** versions of these numbers. The answers will have **1/4rd**  as many **decimals** as the original value under the radical sign.



\*\*We can also take the **4th roots** of **large number** versions. The answers will have **1/4rd** the **zeros** as the original value under the radical sign.

Ex:



i)  ii)  iii) 

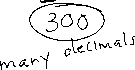


iv)  v)  vi) 



**Some more examples:**

i)  ii) 



iii) 



**Estimate (to one decimal)**



1.  ii)  ii) 



Ex: Order the following from least to greatest by estimating:



, , , , , 

