10/4/21 P-8 Math-437

AH: #1:

Who proved that π is irrational?

AH #2: A rational number x is rational if it is a root of a equation ax + b = 0

(1.) Who proved that π is irrational?

Johann Heinrich Lambert

(b.) Who proved π was transcendental?

Ferdinand Von Lindemann.

(c.) Shown Below Prove $\sqrt{3}$ is irrational.

(d.) Why is 355/113 important and famous? ⟹ It is an approximation for pi! Better than 22/7.

$\pi: \frac{11}{4} \rightarrow 2 + \frac{3}{4} \Rightarrow \frac{4}{3} = 1 + \frac{1}{3} \rightarrow 3$

$\{\frac{11}{4}\} = \{2, 1, 3\} \Rightarrow \boxed{2 + \cfrac{1}{1 + \cfrac{1}{3}}}$

(c.) $\sqrt{3}$. Let's say for the sake of contradiction that $\sqrt{3}$ is rational.
Therefore $\sqrt{3} = \frac{m}{n}$ where $m, n \in \mathbb{Z}$ and $\gcd(m,n) = 1$.
If $\sqrt{3} = \frac{m}{n} \Rightarrow 3 = \frac{m^2}{n^2}$, so $3n^2 = m^2$. m^2 must be divisible by 3, and so must n^2,
which means n, m share a factor so they cannot be coprime and thus $\gcd(m,n) > 1$.
Thus, $\sqrt{3}$ is irrational.