into two classes. The upper class contains all rational numbers such that $c^2 < 7d^2$. The cut number is $\sqrt{7}$.

2.2361	belongs to class $a^2 > 5b^2$	The number 4.8821 belongs to the upper class, and the number 4.881 to the lower class, the cut number of this section defines the number $\sqrt{5}+\sqrt{7}$.
2.646	belongs to class $a^2 > 7d^2$	
4.8821		
2.236	belongs to class $a^2 < 5b^2$	
2.646	belongs to class $a^2 < 7d^2$	
4.881		

→ 2.646

Problems – Irrational numbers

1. Select from the following list all irrational numbers.

a) $\sqrt{2}+\sqrt{3}$ b) $\sqrt{12769}+\sqrt{841}$ c) 0.9

d) $\sqrt[3]{2}\sqrt[3]{4}$ e) $(\sqrt{27})/(\sqrt{3})$

— 25/02/2019

a) $\sqrt{2}+\sqrt{3} = 1.\cancel{41163703}^{1.41421356} + \sqrt{3} = 3.1462437$ I

b) $\sqrt{12769}+\sqrt{841} = 113 + 29 = 142$ $\mathbb{R}$ & $\mathbb{N}$

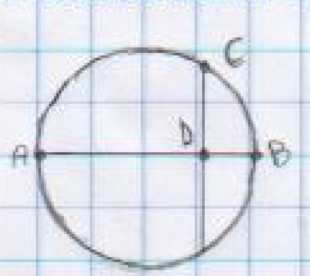
c) 0.9 $\exists$ $\mathbb{Q}$

d) $\sqrt[3]{2}(\sqrt[3]{4}) = 2$ $\mathbb{R}$ & $\mathbb{N}$ → $\sqrt[3]{2} = 1.25992105 \times 1.58740105 =$ → I (I) → $\mathbb{N}$

e) $(\sqrt{27})/(\sqrt{3}) = 5.19615242 \div 1.73205081 = \mathrm{I} \div \mathrm{I} = 3$ – $\mathbb{R}$ & $\mathbb{N}$ — P82

2. Geometry introduced irrationals historically. The square root of a given integer n can ~~mostly~~ readily be found geometrically. Draw a semicircle whose diameter in any suitable unit of lenght is n+1 units. Let it end points on the circumference be A and B. Let C be another point on the diameter, one unit in lenght from B, and n units from A. At C erect a perpendicular to the diameter, intersecting the circumference at D. The lenght CD of this perpendicular line segment is the required square root of n. Why? In this manner construct a line segment equal to $\sqrt{7}$.

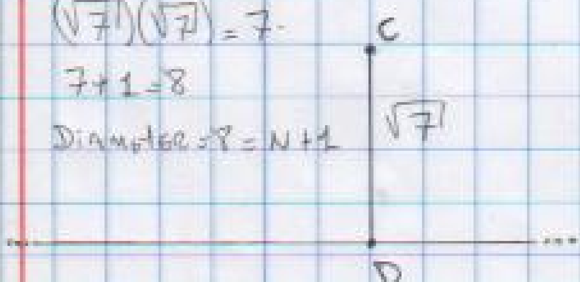
— 27/02/2019



$(\sqrt{7})(\sqrt{7}) = 7$

$7+1=8$

Diameter $= 8 = N+1$



3. Draw the circle whose equation is $x^2+y^2=4$, i.e., the circle whose center is the origin and whose radius is 2 units in lenght. Now draw the line equation is $y=x$. It

2020/01/12