Egypt (~3000 BCE): Rhind papyrus

| = 1, ∩ = 10, ? = 100

0 = "evenness", unit fractions, $\frac{2}{3}$, $\frac{3}{4}$

circl: $A = \left(\frac{8}{9}d\right)^2 \rightsquigarrow \pi \approx \left(\frac{16}{9}\right)^2$

year = 360 + 5, 12 knots 3+4+5
(12 × 30)

no quadratics

Mesopotamia (~2000 BCE)

#: base 60 w/ base 60 fractions

no zero, no decimal pt

Plimpton 322: table of pyth. triples

knew quadratic formula

Zodiac, yr = 354 days

ecliptic ~> celestial equator

$\pi \approx 3$

<u>Greece</u> (~700 BCE — 400 CE)

Thales — Pythagoras — Plato — Aristotle — Euclid

— Archimedes . Apollonius — Diophantus — Hypatia

#: cipher, no 0, unit fractions

pyth thm: proved by Euclid.

quad. eqn: Euclid.

Archimedes: $3\frac{10}{71} < \pi < 3\frac{1}{7}$

Hipparchus: 3;8,30 (sexig.)

<u>China</u> (~2000 BCE, math from ~200 BCE)

decimal system w/ decimal fracs.

+ neg. #s

Jinzhang – 9 chapters

comm. by Liu Hui (+10th chapter)

diagram for pyth. thm.

Jia Xian, Qin Jinshao: solve poly. eqns.

In 9 ch: $\pi \approx 3$, Hui: $\pi \approx 3.14$

by 500: $\pi \approx 3.1415926$

astronomy - primitive

India: (~600 BCE —)

Sulbasutras prove Pyth. thm.

— 600 CE - used cipher

after: used decimal system

no zero, no neg.

astronomy: better than Chinese

Pi: $A = \left(\frac{13}{15}d\right)^2 \Rightarrow \pi \approx \left(\frac{26}{15}\right)^2$

Islamic (~700 CE –)

system: base 10 decimal system
w/ decimal fractions

$\pi \approx 3\frac{1}{7}; \sqrt{10}; 3.1416$

astronomy: based on Greeks