History Notes 4

- Solutions Posted to math.ucr.edu/ampierce/hist
- Office Hours on Picnic Hill
- Midterm on Friday the 3rd

Hard

X. If you slice a cylinder at an oblique plane, then the cross-section is an ellipse. Justify this.
Recall that the standard eqs for a cylinder and plane are $x^2+y^2=1$ & $ax+by+cz=0$.

1. Let $x^2+y^2=1$ be our unit circle, and consider the parabola $y=4x^2+C$. For which values of C, does the parabola intersect the circle at 1, 2, 3, 4 places?

2. Find the rational number whose continued fraction is given by the sequence
(i) $\{1\ 2\ 3\ 4\ 5\}$ (ii) $\{9\ 8\ 7\}$

B.

3. Using a calculator, start computing a continued fraction expansion for π. Use a truncation of this expansion to get a rational approximation for π.

4. For a sphere inscribed in a right circular cylinder w/ height and diameter equal to the diameter of the sphere, prove $\frac{3}{2}V_{sphere}=V_{cylinder}$ and $\frac{3}{2}SA_S=SA_C$.