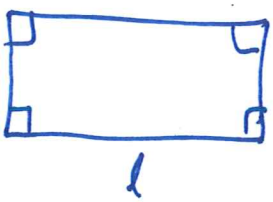
Math 101, Lecture 1, 4/1/17

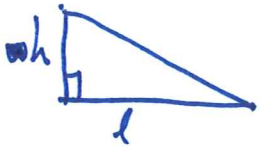
Goals (1) Introduction — slides / website
(2) The Area Problem

The Area Problem

Easy:

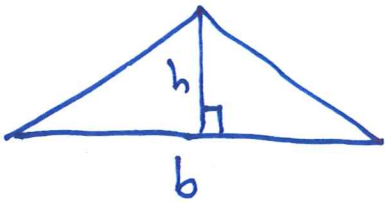


area of rectangle is $w \cdot l$



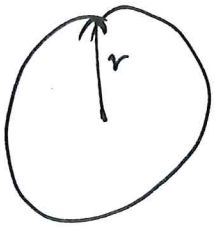
area of triangle: $\frac{1}{2}lh$

why?



area is $\frac{1}{2}hb$

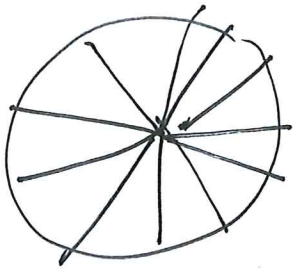
Harder:



area of disc is πr^2

why?

Chop it up:



divide disc into wedges
each wedge is ≈ triangular.
all have height ≈ r

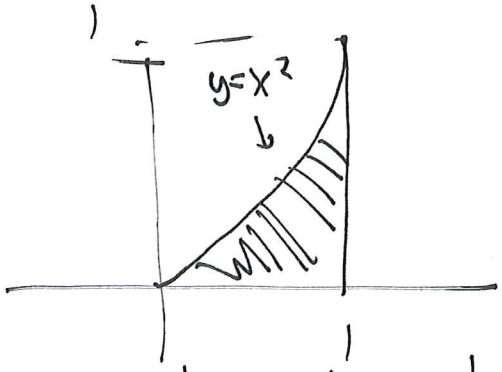
total area $= \frac{1}{2}rb_1 + \frac{1}{2}rb_2 + \frac{1}{2}rb_3 + \cdots = \frac{1}{2}r(b_1 + b_2 + b_3 + \cdots)$

(b_1, b_2, b_3: bases of wedges)

Total bases ≈ circumference $= 2\pi r$

So area $= \frac{1}{2} r \cdot 2\pi r = \pi r^2$

Problem: Area under parabola



Friday: chop up region into vertical strips, add areas