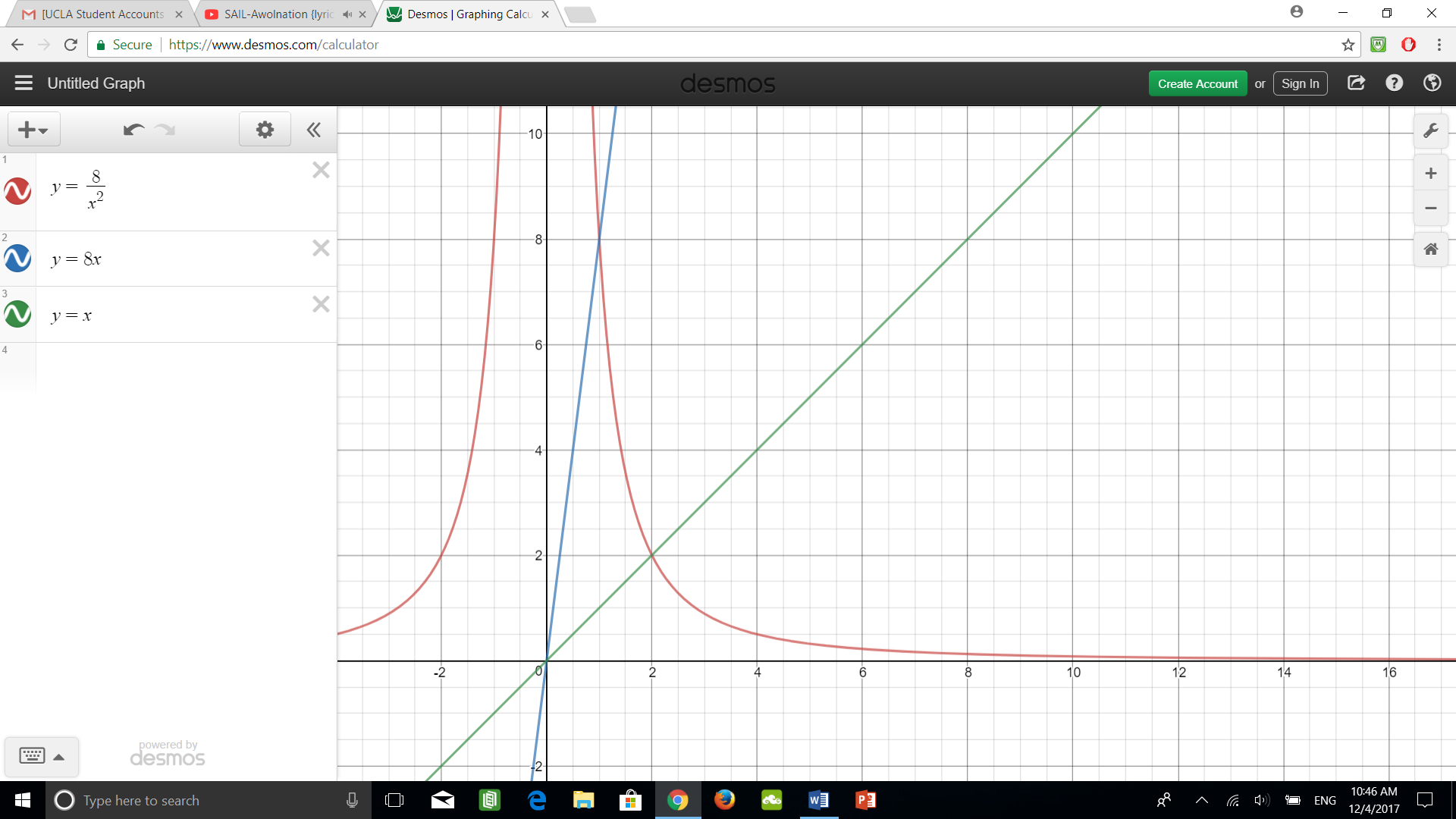
Khyle Calpe

405016683

12/4/2017

Math 31A Lecture Notes: Integration of Volumes

Example 1: Find the area of the region enclosed by , , and



Sol: S1: Sketch region by intersecting the graphs

Intersect and : ;

Intersect and : ;

S2: Calculate the areas and add up

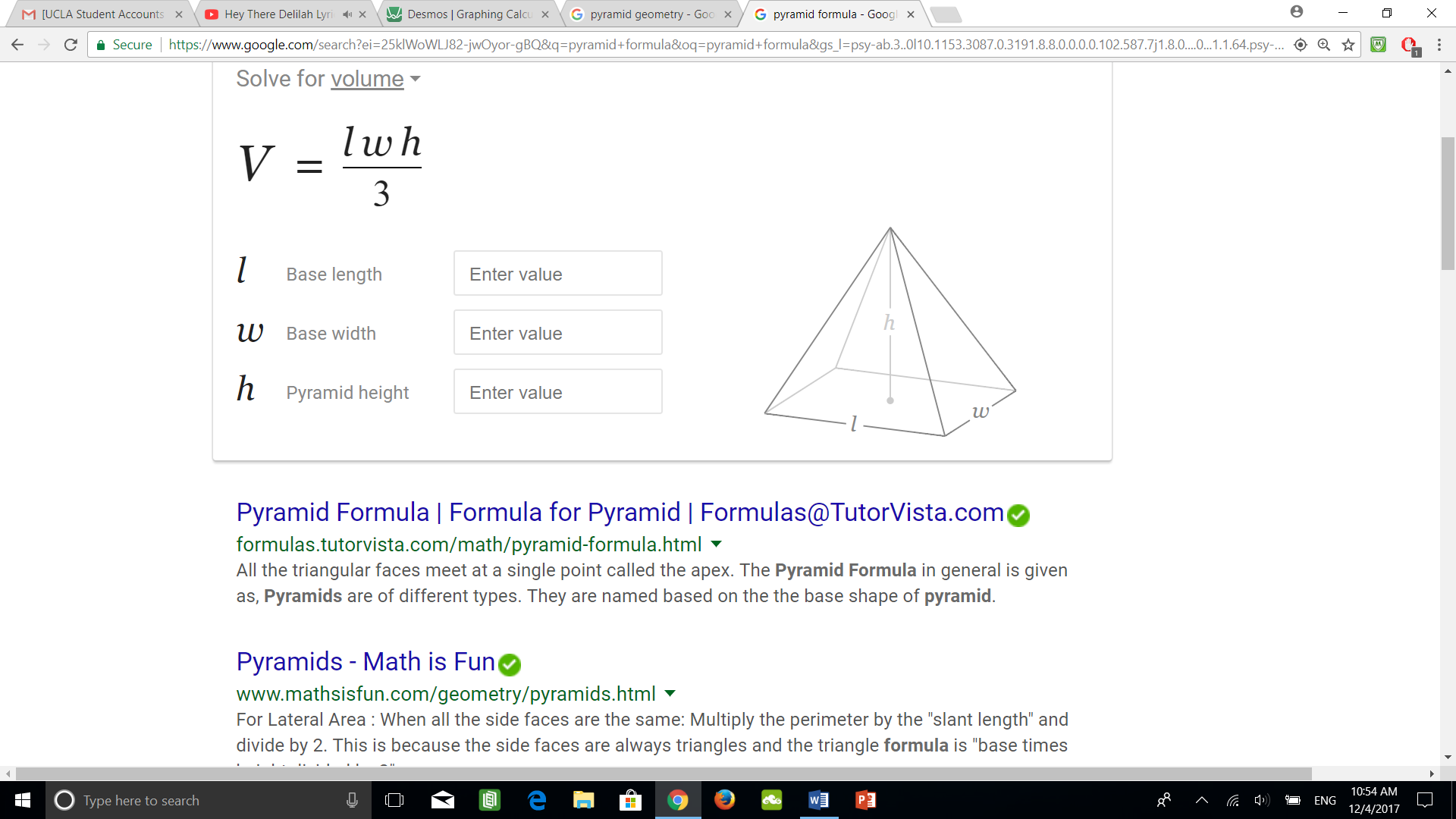
Area

Definition; Integration of Volumes:

Let be the area of the horizontal cross section of a solid extending from to . The volume of the solid is given by:

Example 2: Find the volume of a pyramid with the measurements

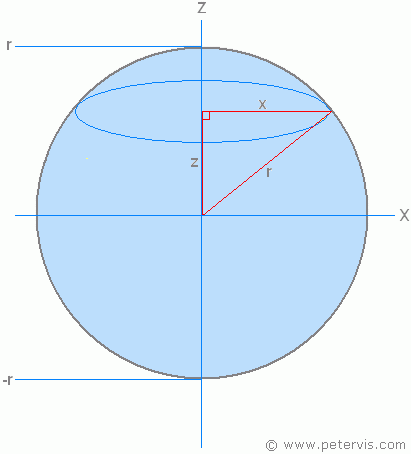
\* Treat the pyramid as a formation of multiple square cross sections; hence, we attain a changing height and side via proportionality of the initial side and height to the changing side and height.

 Sol: S1: Find the varying side length and compute for the area function

;

S2: Compute the volume

Example 3: Compute the volume of a sphere of radius R

 Sol: S1: Compute the area of a horizontal cross section

by Pythagorean theorem

S2: Compute integral