In class we discussed how to find the volume of a cone and a square based pyramid with specific dimensions. Now I want you to find the general formula for the volume of a cone, square based pyramid, and a sphere.

The questions must be solved using the integration formulas developed in class.

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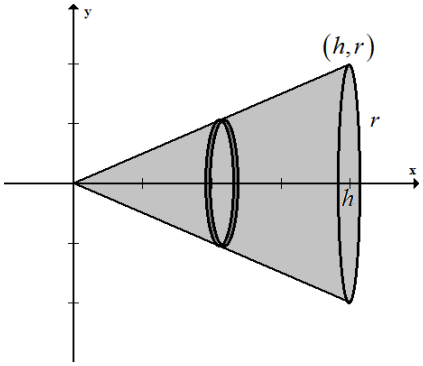
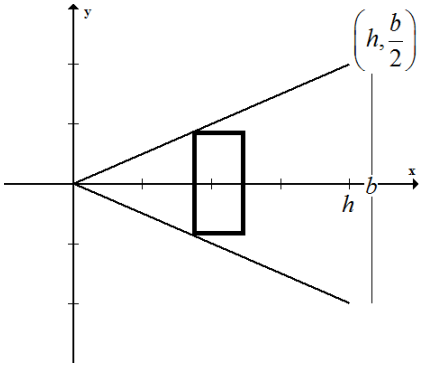
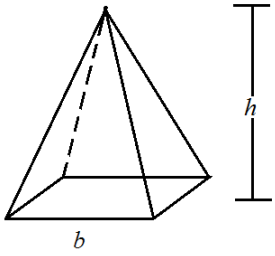
**#1** Given a general cone with radius $r$ and height $h$ (picture below), show that the formula for the volume is $V = \frac{1}{3}\pi r^2 h$




**#2** Given a square based pyramid with base $b$ and height $h$ (picture below), show that the formula for the volume is $V = \frac{1}{3}b^2 h$




**#3** Given a sphere with radius $r$ (picture below), show that the formula for the volume is $V = \frac{4}{3}\pi r^3$