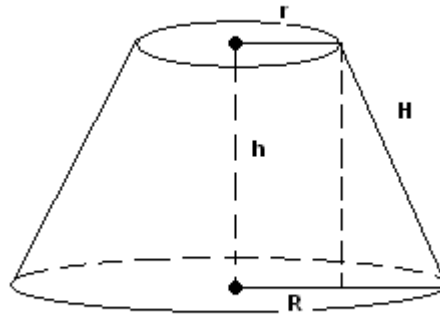


## 8.1: Areas and Volumes

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### Problems

1. Using integration, find a formula for the volume of a pyramid with a square base with length  $L$  and a height  $h$ .
2. A *conical frustum*, pictured below, is a cone with the top cut off. Using integration, find a formula for the frustum pictured below with base radius  $R$ , top radius  $r$ , height  $h$  and slant height  $H$ .



3. A rectangular tank is 2m deep and has sloped sides and a rectangular base with a width of 2m and a length of 3m and the top is a rectangle with a width of 4m and a length of 6m. Write an integral that gives the volume of the tank.

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**Answers**

1.  $\frac{1}{3}L^2h$    2.  $\frac{\pi h}{3(R-r)}(R^3 - r^3)$    3.  $\int_0^2 (2+z) \left(3 + \frac{3}{2}z\right) dz$