Section Test # 1

Save all your work for this exam as test1.xlsx on the K: drive.

A concrete slurry bucket is designed in the following shape:

a

h

b

The shape is a square of side length b, lifted up a height h and smoothly expanded to a side length of a. This would look like two concentric squares from the top, and a trapezoid from the side.

 1. Given the dimensions of **a**, **b**, and **h** in feet, compute the volume V (in cubic feet) of concrete that would be in the bucket if filled to height **f** (in feet). A formula for the Volume V in terms of the parameters a, b, h, and f is:

 $V=\frac{1}{3}\frac{h}{a-b}\left[\left(b+\left(a-b\right)\frac{f}{h}\right)^{3}-b^{3}\right]$

As a test, you should see a volume of 111.5 ft^3, when a=8 ft, b=3 ft, h=12 ft, and f=6 ft.

2. For the case a=8 ft, b=3 ft, h=12 ft, make a graph of the volume V in terms of the fill height f, as f varies from 0 to 12 in one foot increments.

3. Add a regression line, including the regression formula.

4. Create a lookup that will give the fill height **f** for a requested volume **V**.

5. Use solve or goal seek repeatedly for the case a=8 ft, b=3 ft, h=12 ft, to find the fill height (within 1/10 of a foot) to obtain a volumes of 50, 100, 150, 200, 250, and 300 cubic feet.