St Louis Arch

- Data:
  - Highest point: $f_c = 625{,}0925\, ft$
  - Half span: $L = 229{,}2239\, ft$
  - Cross section area, bottom: $Q_b = 1262{,}6651\, ft^2$
  - Cross section area, top: $Q_t = 125.1406\ ft^2$
  - Coefficients: $A = \dfrac{f_c}{Q_b / Q_t - 1} \qquad C = \operatorname{acosh} \dfrac{Q_b}{Q_t}$
  - Equation for center line: $y = A\left(\cosh \dfrac{C\,x}{L} - 1\right)$
  - Cross section area along center line: $Q = \dfrac{Q_b - Q_t}{f_c} y + Q_t$
- Draw the center line
- Calculate the length and volume