(1) Consider the region \( S \) that lies between the three curves
\[ y = \arccos x, \quad x = 0 \quad \text{and} \quad y = \frac{\pi}{3}. \]
A crude sketch appears on the right ⇒
Calculate the area of \( S \). (Hint: Try to avoid integrating \( \arccos x \).)
Area =

(2) Using the cylindrical shell method, find the resulting volume if the region between the three curves \( y = \cos x, y = 0 \) and \( x = \frac{\pi}{3} \) is rotated around the \( y \)-axis.
First write down the appropriate integral:
\[
\int
\]
Then solve the integral:
Volume =

(3) A reluctant burro is pulled along a path by a man who must exert a force of
\[ \frac{10}{(1 + x)^2} \]
pounds when the burro is a distance \( x \) feet from the beginning of the path. How much work does he need to do to move the burro 4 feet down the path? First write down the appropriate integral:
\[
\int
\]
Then solve the integral:
Work =
(4) On the planet PsK!, the standard unit of length is the gronka, abbreviated \( gr \). Acceleration due to gravity is always 20 gronkas/sec\(^2\). A ball is dropped from the top of a very tall tower.

- What will the velocity of the ball be after \( t \) seconds? \( \quad \text{gr/sec} \)
- How far will the ball have dropped after \( t \) seconds? \( \quad \text{gr} \)
- What will the velocity be when the ball has dropped \( r \) gronkas? \( \quad \text{gr/sec} \)
- What is the average velocity of the ball over the first 5 gronkas? \( \quad \text{gr/sec} \)

![Figure 1. Elbonian SAT's](image)

(5) The huge City University of Elbonia admits anyone with a Math SAT of 400 or over. Here is a graph of the number of students admitted for each SAT score between 400 and 800 (a perfect score). For example, according to the graph, about 57 students had a Math SAT of 635. Using \( n = 4 \) on the interval \([400, 800]\) estimate the total number of students admitted

- Using the Trapezoidal rule: 
- Using Simpson’s rule: