Solutions to Application Problems assigned in class (set 1)

1) Find the area between \( \sin x \) and \( \cos x \) (one "cell"):

2) Find the volume of a pyramid with an equilateral triangle base of side length 2 and height 6:

3) Find the volume of the solids of revolution:
   a. between \( y = x^2 \) and \( y = x^4 \), about \( x = 7 \):
   b. between \( y = x^3 \) and \( y = 4x \), about \( y = b \) (I said \( y = 20 \) in the morning class and changed it to something else, which I don't remember, in the afternoon class; this formula is valid for any \( b \geq 8 \).
   c. between \( y = \ln x \), \( y = 0 \), \( x = 2 \), about \( x = -3 \):

4) Find work:
   a. Roll up a 40 ft chain 1/4 of the way, with a 20 lb bucket on the end (chain weighs 2 lb/ft)
   b. Pump all the water out of a cone (with sharp end down) with radius 2 ft, height 8 ft
   c. Pump half the water out of a sphere of radius 5 ft

5) Find the fluid force ("hydrostatic force"):
   a. [Diagram of a triangle with dimensions 2 m, 2 m, 3 m]