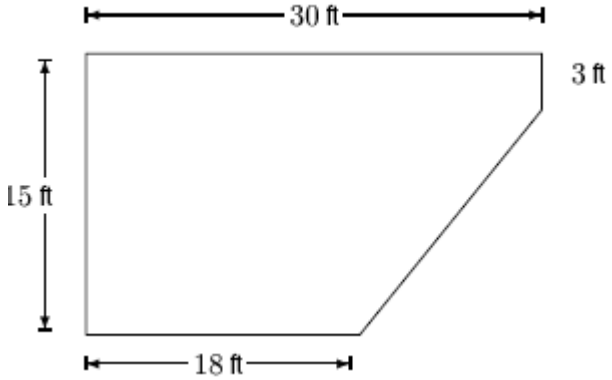
MATH 162 PRACTICE QUIZ 2-B

1. A swimming pool has the shape shown below:



If the pool is 13 ft. deep, how much work is done in pumping all the water out? (*Note:* Water weighs 62.4 lbs per cubic foot.)

2. The Great Cone of Alphaville was built by high school students during their summer vacation. The cone is 100 feet high and its base has a diameter of 80 ft. It has been built from bricks (made of straw) which weigh 3 lbs/ft^3. Express as a Riemann integral the amount of work done in building the Great Cone.

3. A chlorine solution is poured over the surface of a rectangular swimming pool that is 20 meters long, 13 meters wide, and 2 meters deep everywhere. Before the circulating pumps are turned on, it is discovered that the density of the chlorine solution at a height *h* meters above the bottom of the pool is given by $\rho(h) = 100(2 - h)$ gm/m^3. (That is, the chlorine solution's density is greater near the bottom of the pool.)

(a) Express the total mass of chlorine in the pool as a Riemann sum.

(b) Transform the Riemann sum of part (a) into a definite integral that gives the total mass of the chlorine solution in the pool. Evaluate the integral.

4. The density of cars (in cars per kilometer) down a 20 km stretch of the Auto-Route near Bordeaux is given by $\rho(x) = 600 + 120 \sin(\pi x)$ where *x* is the distance in miles from the toll plaza and $0 \leq x \leq 20$.

(a) Write a Riemann sum that estimates the total number of cars along this 20 km stretch.

(b) Convert this sum to a Riemann integral and evaluate it.

5. Find a parameterization of the circle centered at C = (7, 11) and having radius 4. Choose the clockwise direction.

6. Give a parameterization of the line segment beginning at P = (-3, 4) and terminating at Q = (9, 9).

7. Parameterize one cycle of the curve y = sin 14x.

The limits of my language are the limits of my world.

- Wittgenstein, **Tractatus Logico-Philosophicus**