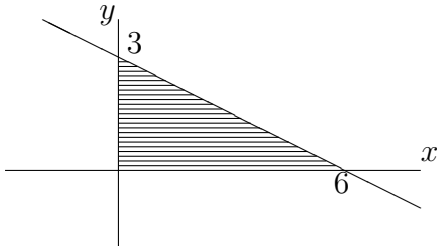


1. (6) Find the total mass of the shaded triangular region shown below which has density $\delta(x) = (\frac{1}{2}x)^2 + 1$ kg/cm².



2. (6) The density of cars, given in cars per mile, along a certain stretch of road is approximated by $\rho(x) = 200(2 + \cos(.4x))$, at a distance x miles north of the Berman toll bridge. Find the total number of cars on the 15 mile stretch of road *starting 5 miles south of the bridge*.

3. (8) A tank is created by taking a conical tank with a base diameter of 8 feet and height 16 feet and cutting off the top 9 feet and then inverting it. Thus the resulting tank is 7 feet tall, with a diameter of 8 feet at the top. A cross section of the tank is shown below. The tank is filled to a height of 5 feet with a substance whose density is given by $\delta(h) = 100 - 2h$ lb/ft³, where h is measured as feet from the bottom of the tank. Find the weight of the substance in the tank.

