Answer on Question #57995 – Math – Geometry
Question

A tank, open at the top is made of sheet iron 1 in. thick. The internal dimensions of the tank are 4 ft., 8 in. long; 3 ft. wide 6 in. wide; 4 ft. 4 in. deep. Find the weight of the tank when empty, and find the weight when full of salt water.

Solution

Sides:

        4 ft. 8 in. = 4,67;
        3 ft. 6 in. = 3,5;
        4 ft. 4 in. = 4,33.

Density of steel is 506 lb/ft^3.

Let's find volumes of each side.

Bottom: 4 ft. 8 in. * 3 ft. 6 in. * 1 in. = 1,63 ft.;

2 opposite sides: 3 ft. 6 in. * 4 ft. 4 in. * 1 in. = 1,516 ft.;

2 another opposite sides: 4 ft. 8 in. * 4 ft. 4 in. * 1 in. = 2,022 ft.

So, <u>weight of tank when it is empty</u> is (1,63 + 1,516 + 2,022) * 506 = <u>2 615,0 lb</u>.

Density of seawater is 64 lb/ft^3.

Volume of tank is 4 ft. 8 in. * 3 ft. 6 in. *4 ft. 4 in. = 70,77 m^3.

So, <u>weight of tank when it is full of salt water</u> is
 2 615,0 + 70,77 * 64 = 2 615,0 + 4 529,28 = <u>7 144,28 lb.</u>