MATH 1710: Tutorial 6 (Fluid Pressure)

1. The vertical end of a water trough is an isosceles triangle with width 2 m and depth 1 m. Find the force of the water on each end when the trough is half full by volume.

2. A rectangular swimming pool full of water is 25 m long and 10 m wide. The depth is 3 m for the first 10 m at the deep end, decreasing linearly to 1 m at the shallow end. Find the force due to the weight of the water on each of the sides and ends of the pool.

3. A cylindrical oil tank of radius r and length h has its axis horizontal. If the density of the oil is ρ, find the force on each end of the tank when it is half full.

4. A plate is in the shape of an isosceles triangle with equal sides of length 5 m and the third side of length 3 m. It is suspended vertically in water with its shortest side in the surface of the water. Find the force due to the water on one side of the plate.

5. The vertical face of a dam across a river has the shape of a parabola 20 m across the top and 5 m deep at the centre. What is the force that the river exerts on the dam if the water level is 1.8 m below the top?