Chapter 6 review continued.

Name: _____ Period: _____

NO GRAPHING CALCULATORS. Show your integral setup, calculations, and appropriate units.

The weight density of water is $62.4\ lb/ft^3$.

1.

An empty bucket weighs 2 lb and initially contains 10 lb of water. It is lifted 5 ft while water leaks uniformly. At the top, 5 lb of water remains. Find the total work required to lift the bucket and water. ($ft \cdot lb$)

2.

Find the volume generated by revolving the region bounded by $y = 4 - x^2$, the x-axis, and the y-axis in the first quadrant about the y-axis.

3.

A vertical rectangular plate is 2 ft wide and 3 ft tall. Its top edge is 1 ft below the water surface. Find the hydrostatic force on one side of the plate. (lb)

4.

Find the volume generated by revolving $y = 2x$, for $0 \leq x \leq 1$, about the x-axis.

5.

An inverted conical tank is 4 ft tall and has a top radius of 2 ft. It is completely filled with water. Find the work required to pump the water to the top rim. ($ft \cdot lb$)

6.

Find the surface area generated by revolving $y = 3x$, for $0 \leq x \leq 1$, about the x-axis.

7.

An inverted conical tank is 6 ft tall and has a top radius of 3 ft. Water fills the tank to a height of 2 ft measured from the bottom tip. Find the work required to pump all the water to the top rim. ($ft{\cdot}lb$)

8.

An 8-ft rope weighs 2 lb per foot and hangs vertically from a platform. Find the work required to pull the first 5 ft of rope onto the platform. $(ft{\cdot}lb)$

9.

An inverted conical tank is 4 ft tall and has a top radius of 2 ft. Water fills the tank to a height of 2 ft measured from the bottom tip. Find the work required to pump all the water to an outlet 1 ft above the top rim. ($ft \cdot lb$)

10.

Find the volume generated by revolving $y = x^2$, for $0 \leq x \leq 1$, about the x-axis.