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Complete all of the problems in class. You may work in pairs and use the textbook.

Name and section: \_\_\_\_\_

### Weekly Summary:

- Hydrostatic pressure and force: (§9.6)

$F = PA$  (force equals pressure times area) at a certain depth, and  $P = \rho g d$  (pressure equals the product of density, gravity, and depth). Therefore we get  $F = \rho g A d$  for a certain depth, and the hydrostatic force is

$$F = \int_a^b P(x)A(x) dx.$$

- Sequences: (§10.1)

- The *limit of a sequence*  $a_n$  is defined by  $\lim_{n \rightarrow \infty} a_n$ , where  $a_n$  are numbers ( $n$ ).
- Squeeze Theorem: If  $a_n \leq b_n \leq c_n$  for all  $n \geq n_0$  and  $\lim_{n \rightarrow \infty} a_n = \lim_{n \rightarrow \infty} c_n = L$ , then  $\lim_{n \rightarrow \infty} b_n = L$ .
- $\lim_{n \rightarrow \infty} r^n = \begin{cases} 0 & : |r| < 1 \\ 1 & : r = 1 \\ \text{div.} & : |r| > 1 \text{ or } r = -1. \end{cases}$
- If  $\lim_{x \rightarrow \infty} f(x) = L$  and  $f(n) = a_n$ , then  $\lim_{n \rightarrow \infty} a_n = L$ .

### Workout Problems:

1. (§9.6) A tank is full of water. The end of the tank is vertical and has the shape of a semicircle of radius  $10m$  with the flat edge up. Find the hydrostatic force against the end of the tank. (Problem 3)
2. (§10.1) Determine whether the sequence  $a_n = \ln(n+1) - \ln(n)$  converges or diverges. If it converges, find the limit. (Problem 24)