

### Quiz 15 (Practice)

If it asks you to set up integrals, that means it is not necessary to evaluate them.

1. Suppose that lumber usage is  $g(t) = 1000e^{0.05t}$  cubic meters per year and new tree growth is  $f(t) = 2000e^{0.02t}$  cubic meters per year. Compute and interpret

$$\int_0^{20} [f(t) - g(t)] dt .$$

2. An object has cross sections that are circles of radius  $4 - x^2$  for  $0 \leq x \leq 2$ . Find the volume of the object.
3. Consider the region bounded by  $y = 1 - x^2$ ,  $y = 0$ , and  $x = 0$  in the first quadrant. Set up integrals for the volume of the solid obtained by revolving the region around
- (a) the x-axis
  - (b)  $y = 2$
  - (c)  $x = -3$
4. Set up the integral for the arc length of the curve  $y = e^{2x}$  from  $x = -1$  to  $x = 1$ .
5. An object is launched from ground level with initial velocity 25 ft/sec at an angle of  $\frac{\pi}{6}$ . A wall, three feet in height, is located 9 feet away from the launch site. Does the object clear the wall?
6. A cone-shaped tank is 10 feet tall with radius 6 feet at the top. Suppose the tank is filled with water up to the 8 foot mark. Set up an integral for the amount of work done in pumping all the water out through the top of the tank.