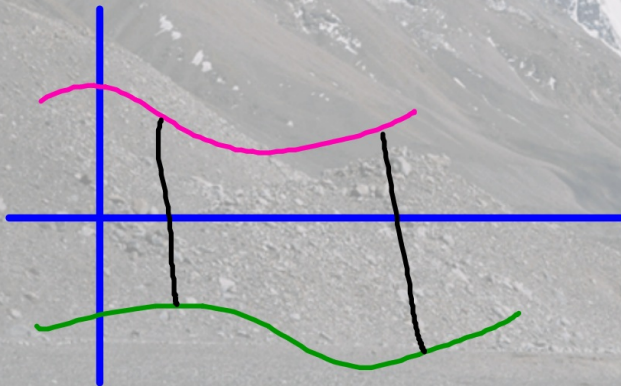


October 17

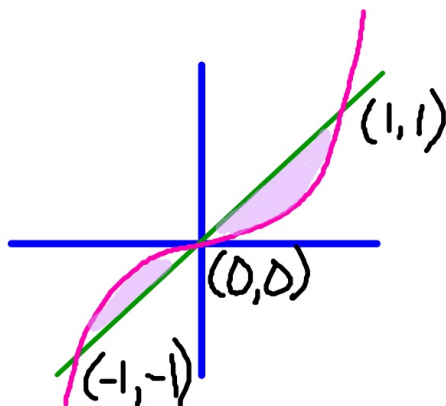
When finding the area of a given region, explain why your answer should be positive.



October 17

Students will verbally explain how to find the area bounded by two functions  
(using the words:  
above, below, right, left...)

Find the area  
bounded by  
 $f(x) = x^3$  and  
 $g(x) = x$



intersection  
points

$$x^3 = x$$

$$\frac{-x}{x^3 - x} = \frac{-x}{-x}$$

$$x^3 - x = 0$$

$$x(x^2 - 1) = 0$$

$$x = 0 \quad x^2 - 1 = 0$$

$$x^2 = 1$$

$$x = \pm 1$$

$$A = \int_{-1}^0 x^3 - x \, dx + \int_0^1 x - x^3 \, dx$$

$$= \left. \frac{x^4}{4} - \frac{x^2}{2} \right|_{-1}^0 + \left. \left( \frac{x^2}{2} - \frac{x^4}{4} \right) \right|_0^1$$

$$= 0 - \left( \frac{-1^4}{4} - \frac{-1^2}{2} \right) + \left( \frac{1^2}{2} - \frac{1^4}{4} - 0 \right) = -\frac{1}{4} + \frac{1}{2} + \frac{1}{2} - \frac{1}{4}$$

$$= -\frac{1}{2} + \frac{1}{2} + \frac{1}{2} = \frac{1}{2}$$