"We seem to understand the value of oil, timber, minerals and housing, but not the value of unspoiled beauty, wildlife, solitude and spiritual renewal."

CALVIN (BILL WATERSON)

1. Define a subset Q of the xy plane as $Q = \{(x, y)|0 \le y \le 1 - x^2, -1 \le x \le 1\}$.

   (a) Find area(Q)

   (b) Find $\overline{x} \times$ area(Q)

   (c) Find $\overline{y} \times$ area(Q)

   (d) Find vol$_{\text{x-axis}}(Q)$

   (e) Find vol$_{\text{y-axis}}(Q)$

2. Express the region Q from question 1 in the form

$$Q = \{(x, y)|f(y) \le x \le g(y), a \le y \le b\}. \tag{1}$$

   Using this representation.

   (a) Find area(Q)

   (b) Find $\overline{y} \times$ area(Q)

   (c) Find $\overline{x} \times$ area(Q)

   (d) Find vol$_{\text{y-axis}}(Q)$

   (e) Find vol$_{\text{x-axis}}(Q)$