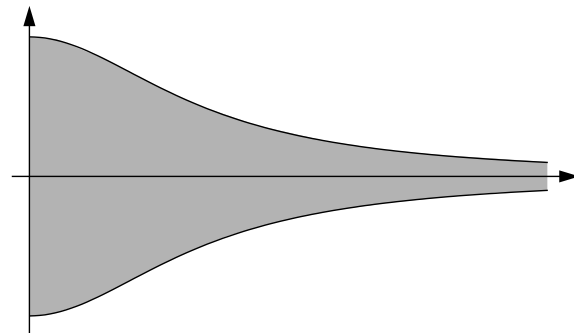


1 Stewart, section 8.3: #23, 25, 27, 29, 31, 34

2 Consider a uniform flat plate bounded by the graph of  $y = 1/(1 + x^2)$ , the graph of  $y = -1/(1 + x^2)$  and the  $y$ -axis. Show that the plate has finite mass, but does not have center of mass at a finite distance. (This means that you could lift up the plate, but you could not balance it!)



3 Find the center of mass of the uniform flat plate bounded by:

a) the curves  $y = x^2 \ln x$  and  $y = -x^2 \ln x$  and the lines  $x = 0$  and  $x = 1$ .

b) the lines  $x = 0$  and  $x = 2$  and the curves  $y = \frac{1}{x^2 + 3x + 2}$  and  $y = \frac{-1}{x^2 + 3x + 2}$ .

4 Find the  $x$ -coordinate of the center of mass of the uniform flat plate bounded by the  $x$  and  $y$ -axes, the line  $x = 2$  and the curve  $y = \frac{1}{\sqrt{x^2 + 6x + 13}}$ .

