

Mock Exam for Final

1. Graph $y = \frac{-2x^2+x+1}{x+3}$.
2. Rotate the area enclosed by $y = x^2$ and $y = \sqrt{x}$ around the line $x = -2$, and find the volume of the resulting solid.
3. Consider a table with a rectangular center and a semicircular cap at each end. The rectangle has length L and width 10, and the two semicircular ends both have radius 5 (thus fit squarely on the side of length 10). What value of L will maximize the perimeter-to-area ratio (P/A) of the table?
4. Find $\lim_{x \rightarrow 0} \frac{\int_{\cos(x)}^1 t \ln(t) dt}{x}$.
5. Find $\lim_{n \rightarrow \infty} \sum_{i=1}^n \sin(i\pi/n)\pi/n$.