

Matriculation number: 10003456

Student name: Joe Schmoe

1. How big is the parabolic segment between the parabola $f(x) = 2x^2$ and the line $g(x) = 4 + 2x$?

Sketch a graph to visualize the desired area.

2. Given the function

$$f(x) = 4x^2 - 6x^3$$

- (a) Sketch f , f' and f'' in one coordinate system.
 - (b) Identify all of the minimum and maximum points and find its inflection points.
3. Find all eigenvalues and eigenvectors of the matrix

$$A = \begin{bmatrix} -12 & 15 \\ 15 & -12 \end{bmatrix}.$$