

syms x

dfdx= @(x) (4.*x.^3 - 2.*x -1) / 2*(sqrt(x.^4 - x.^2 - x +1.25))

xpos = 0.5;

first_order = fsolve(dfdx,xpos) % equal to 0.8846, therefore the stationary
% point is (0.8846, -0.2174)

d2fdx2= diff(dfdx,x)

d2fdx2 = @(x) (6*x^2 - 1)*(x^4 - x^2 - x + 5/4)^(1/2) + ((- 2*x^3 + x + 1/2)*(- 4*x^3 + 2*x + 1))/(2*(x^4 - x^2 - x + 5/4)^(1/2));

% then plug in x=0.8846 to the d2fdx2 equation above

% d2fdx2(0.8846) is equal to 8.37 . Therefore, since the d2f/dx2 is greater

% than zero, it proves that it is a local minimum