Fall 2021 | MECH 6318
Engineering Optimization – Prof. Jie Zhang
HOMEWORK #1
August 31, 2021

DUE: Tuesday, Sep 07, 2021 **5pm (central time)**
Submit the HW to eLearning

Points Distribution
30 points maximum
-5 to 0 points reserved for **Neatness and Professional Presentation**
(legible, stapled, show key Matlab commands, properly labeled plots, etc.)

Book Problems:

Problems 2.10, 2.14, 2.16, 2.18, 2.22, 2.26, 2.27

Additional problem (required solving by hand):

Consider the following function and do all the following by hand:

$$f(x) = 3x_1^2 + 3x_2^2 + 4x_1x_2 + (4x_3 + 2)^2 + 4x_1$$

Part (a)

What are the gradient and hessian of *f(x)*?

Part (b)

What are the stationary point(s) of *f(x)*?

Part (c)

Using the eigenvalues of the hessian, can the stationary point(s) be classified into a minimum, maximum, or saddle point?