

## MTH 210: Lab 7

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**P.** Consider the following function

$$f(\mathbf{x}, \gamma_1, \gamma_2) = 5(x_1^2 + x_2^2) + (\gamma_1 + \gamma_2)x_1x_2$$

where  $\mathbf{x}^T = (x_1, x_2) \in [-10, 10] \times [-10, 10]$  and  $\gamma_1, \gamma_2 \in \mathbb{R}$ . Verify the convexity of  $f$  for

1.  $\gamma_1 = \gamma_2 = 3$ ;
2.  $\gamma_1 = \gamma_2 = 7$ ;
3.  $\gamma_1 = -3, \gamma_2 = 3$ .