## Chapter A2

A2.1 For (g), $f'(x) = -\exp(x^2) < 0$.

A2.2 For (a), $f_1 = 2 - 2x_1$ and $f_2 = -2x_2$. For (e), $f_1 = 3x_1^2 - 6x_2$ and $f_2 = -6x_1 + 3x_2^2$.

A2.3 Chain rule.

A2.5 For (a),

$$\mathbf{H}(\mathbf{x}) = \begin{pmatrix} -2 & 0 \\ 0 & -2 \end{pmatrix}.$$

A2.11 Use the definition of an increasing function and the definitions of local optima.

A2.19 Strict quasiconcavity implies quasiconcavity.

A2.24 For (a), $\mathbf{x}^* = (1, 0)$ is a maximum. For (b), $\mathbf{x}^* = (0, 1)$ is a minimum.

A2.25 (a) $(1, 1)$ and $(-1, -1)$; $f(1, 1) = f(-1, -1) = 2$; (b) $(-\sqrt{1/2}, \sqrt{1/2})$ and $(\sqrt{1/2}, -\sqrt{1/2})$; (c) $(\sqrt{a^2/3}, \sqrt{2b^2/3})$ and $(\sqrt{a^2/3}, -\sqrt{2b^2/3})$; (d) $((1/2)^{1/4}, (1/2)^{1/4})$; (e) $(1/6, 2/6, 3/6)$.

A2.32 The Envelope theorem.