Using b.) Complementary Slackness –

$$\lambda\left(Q_1^2 + 4Q_2^2 - 4\right) = 0$$

$\therefore \quad \lambda = 0 \qquad$ or $\qquad Q_1^2 + 4Q_2^2 - 4 = 0$

from ①,

If $\lambda = 0$,

$$\therefore 0 = \frac{-1}{2Q_1}$$

$$0 \times 2Q_1 = -1$$

$$\boxed{0 \neq -1}$$

Hence, $\lambda \neq 0$. ——— ③

from ③, $\because \lambda \neq 0$ –

$$\therefore Q_1^2 + 4Q_2^2 - 4 = 0$$

using ②, $\boxed{Q_1 = 2Q_2}$

$$\therefore (2Q_2)^2 + 4Q_2^2 - 4 = 0$$

$$4Q_2^2 + 4Q_2^2 - 4 = 0$$