$$f(x) = -4x_1^4 - 8x_1^2 x_3^2 + 5x_2^4 - 6x_2^2 x_3^2 - 2x_3^4$$

$$h_1(x) = 11x_1^2 + 6x_1 x_2 + 10x_1 x_3 + 39x_1 +$$
$$+ 39x_1 + 3x_2^2 + 10x_2 x_3 + 31x_2 + 12x_3^2 -$$
$$- 5x_3 - 120 = 0$$

$$g_1(x) = -43{,}25x_1 - 137{,}25x_2 + 90{,}75x_3$$
$$- 594 \leq 0$$

$$g_2(x) = 106{,}75x_1 + 5{,}75x_2 - 86{,}25x_3 -$$
$$- 380{,}25 \leq 0$$

For point to be stationary it must satisfy the following conditions:

1. Stationarity:
2. Complementarity
3. Primal feasibility
4. Dual feasibility

Let's check those criteria for all points.