(1) The function \( f(x, y) = x^4 + y^4 - 4xy + 5^{\frac{1}{2}} \) has

(a) local minimum at \((1, 1), (-1, -1)\) and saddle point at \((0, 0)\)

(b) local maximum at \((1, 1), (-1, -1)\) and saddle point at \((0, 0)\)

(c) local minimum at \((1, 1), (-1, -1), (1, -1)\) and \((-1, 1)\) and saddle point at \((0, 0)\)

(d) local minimum at \((1, 1)\) and saddle point at \((0, 0)\)

(2) The maximum value of \( f(x, y) = x + 2y - 3z \) subject to the constraints \( z = 4x^2 + y^2 \) is equal to

(a) \( \frac{17}{48} \)

(b) \( \frac{7}{5} \)

(c) 0

(d) 5

(3) If \((a, b)\) is a critical point of a function \( f \), and if \( f_{xx}(a, b) = -2 \) and \( f_{yy}(a, b) = 3 \), then what can one say about \((a, b)\)? Justify your answer.