Economics 703 : Final Exam

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Choose three of the four questions to answer. Each question is worth 33 points, with one point given away for free.

Please be very explicit in your answers. Carefully state the appropriate definitions and theorems and argue how they apply. Also, make sure that every step in your argument follows logically and directly from the previous step.

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1. Let $f : \mathbb{R}^3 \to \mathbb{R}$ be given by the rule $f(x, y) = 2x^3 - 3x^2 + 2y^3 + 3y^2 + 40$. Find the global maximizer(s) of f.

2. Solve the problem: $Min\ (x_1^2 + x_2^2 - 8x_1 - 8x_2 + 32)$
   subject to:
   $$3x_1 + 2x_2 \geq 12$$

3. Give an example of a quasiconcave function that is not concave.

4. Solve the problem:
   $$Max(x + 2y + 3w + xy - yw)$$
   $$x + y + w = 10.$$