Name: _____

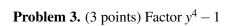**Instructions:** Each question is worth 3 points but the last question. Question 4 and 5 are worth 1 point.
Show all your work in order to receive credit.

Problem 1. (3 points) Distribute and simplify.

(a) $-4x^3 - x(3x^2 + 7) + x + (2 + 10x^2)$

Problem 2. (3 points) Factor (by grouping). $25c - cr + 25r - c^2$

Problem 3. (3 points) Factor $y^4 - 1$

Problem 4. (1 points) **Extra credit**. Simplify the complex fraction into one. $\dfrac{\dfrac{4}{b}}{\dfrac{5}{b} + \dfrac{6}{a}}$

Problem 5. (1 points) **Extra credit**. Let's see how logical you truly are. Are the following two statements logically the same?

1. *If* the cat has a big pouch *then* the cat is fat.
2. *If* the cat is not fat *then* the cat does not have a big pouch.