> **Read each question carefully and be sure to SHOW ALL WORK. Correct answer without proper justification will not receive a "Complete" grade. Paç fat! Good luck!**

Name: _____

LO 12. Partial Fractions. I can apply partial fraction as needed.

Criteria for Success: I can

- use long division in combination with partial fractions to solve integrals

- decompose a fraction into a sum of two or more fractions of a specific form.

Question: Consider the integral $\int \dfrac{3x^2 - 1}{x^3 - x}dx$.

(a) Solve this integral using partial fractions decomposition. Note that you can easily solve it using regular u-substitution, but that's not what this LO is testing.

(b) Find A, B, C such that $\dfrac{3x^2 - 1}{x^3 - x} = \dfrac{Ax + B}{x^2 - 1} + \dfrac{C}{x}$ using the same process as for the partial fraction decomposition.

(c) Now solve the original integral using the above decomposition $\dfrac{Ax + B}{x^2 - 1} + \dfrac{C}{x}$ instead.

$$\int \frac{3x^2 - 1}{x^3 - x}dx =$$