To receive full credit you must show work.

1. Improper Integrals:

    (a) [**2 points**] **Infinity is weird!!** In your own words (1-3 sentences), explain why we need limits to make sense of improper integrals.

    (b) [**2 points**] Rewrite $\int_1^\infty \frac{1}{x^2}\,dx$ and $\int_{-2}^3 \ln|t|\,dt$ using limits as necessary
    (If you have time, do they converge or diverge?).

2. Partial Fractions:

    (a) [**3 points**] Decompose the following into partial fractions (you do **not** need to solve for the coefficients):

    $$\frac{x^4 - x^3 + 2x + 1}{(x-3)^3(x^2+9)} =$$

    (b) [**3 points**] Find $\int \frac{2x+1}{(x-2)(x+3)}\,dx$

Total: ☐ /10