1. [11 points] For each of parts **a - d** below:

- Find the *exact* value, if possible. Recall that $x = \sqrt{2}$ is a solution in exact form to the equation $x^2 = 2$, but $x = 1.41421356237$ is <u>not</u>.
- If the given limit or integral either does not exist or diverges, write "DOES NOT EXIST".
- If there is not enough information, write "NOT ENOUGH INFO".
- You do not have to show work, but work shown might be considered for partial credit.

a. [2 points] Suppose $f(x)$ is a continuous, positive, and decreasing function such that $\int_2^\infty f(x)\,dx$ converges. Find $\lim_{x\to\infty} f(x)$.

Answer: $\lim_{x\to\infty} f(x) =$ _____

b. [3 points] Find $\int_0^\infty \frac{1}{x^{0.7}}\,dx$.

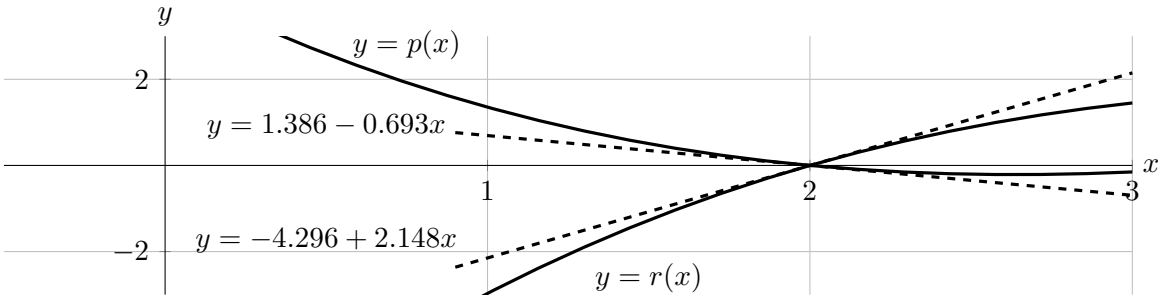
Answer: $\int_0^\infty \frac{1}{x^{0.7}}\,dx =$ _____

c. [3 points] Suppose μ is a real number. Find $\int_{-\infty}^\infty e^{-(x-\mu)^2/0.0002}\,dx$.

Your answer may involve μ.

Answer: $\int_{-\infty}^\infty e^{-(x-\mu)^2/0.0002}\,dx =$ _____

d. [3 points] The graph below shows two functions $p(x)$ and $r(x)$, as well as their tangent lines at $x = 2$.



Find the value of $\lim_{x\to 2} \frac{p(x)}{r(x)}$.

Answer: $\lim_{x\to 2} \frac{p(x)}{r(x)} =$ _____