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Give an answer. Show all work. No calculators are allowed.

1. Compute and justify the limit

$$\lim_{x \rightarrow \infty} \frac{x^{20} + e^x}{e^{2x} + \ln(x)}$$

2. A farmer has 2400 feet of fencing and wants to fence off a rectangular field which borders a straight river. He doesn't need any fence along the river. What are the dimensions of the field that has largest possible area?