Quiz 4

Name: _____ Section and/or TA: _____

Answer all questions in a clear and concise manner. Unsupported answers will receive *no credit*.

1. (2 points) Find $\lim_{n\to\infty} 2e^{-1/n}$.

> **Solution:** Compute
> $$\lim_{n\to\infty} 2e^{-1/n} = 2 \cdot \lim_{n\to\infty} e^{-1/n}$$
> $$= 2e^{[\lim_{n\to\infty}(-1/n))]}$$
> $$= 2e^0$$
> $$= 2$$

2. (2 points) Does the series $\sum_{n=1}^{\infty} \dfrac{4}{1 + e^{-n}}$ converge? Why or why not?

> **Solution:** A necessary condition for convergence of $\sum a_n$ is that $\lim_{n\to\infty} a_n = 0$. But
> $$\lim_{n\to\infty} \frac{4}{1 + e^{-n}} = 4.$$
> Since the terms of the series do not decrease to zero, the series must diverge.