

2. [4 points] Compute the following limit. Fully justify your answer and use **proper limit notation**.

$$\lim_{x \rightarrow 0} \frac{\sin^2(7x)}{\cos(7x) - 1}$$

Answer: $\lim_{x \rightarrow 0} \frac{\sin^2(7x)}{\cos(7x) - 1} =$ _____

3. [7 points] **Compute** the value of the following improper integral if it converges. If it does not converge, use a **direct computation** of the integral to show its divergence. Be sure to show your full computation, and be sure to use **proper notation**.

$$\int_2^{\infty} \frac{e^{-3/x}}{x^2} dx$$

Circle one: **Diverges** **Converges to** _____