Superconductivity Course Final Examination

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1. Is it true that $x^n + y^n = z^n$ if x, y, z and n are positive integers?. Explain.

2. Prove that the real part of all non-trivial zeros of the function $\zeta(z)$ is $\frac{1}{2}$

3. Compute

$$\int_0^\infty \frac{\sin(x)}{x}$$