(1) Use an $\epsilon$-$\delta$ proof to prove that $\lim_{x \to 5} (2x + 5) = 15$.

(2) Use an $\epsilon$-$\delta$ proof to prove that $\lim_{x \to -5} (-2x - 20) = -10$.

(3) Use an $\epsilon$-$\delta$ proof to prove that $\lim_{x \to 0} x^2 \sin \frac{1}{x} = 0$.

(4) Use an $\epsilon$-$\delta$ proof to prove that $\lim_{x \to \pi} (x^2 - 2\pi x) = -\pi^2$.

(5) Do Problem 19 in Chapter 5 of Spivak.
   
   Hint: See the discussion at the bottom of page 98 and the top of page 99. Also, you may use (without proof) that fact that every open interval in the real line contains infinitely many irrational numbers and infinitely many rational numbers.