Problem 1. *Vocabulary: what do the following phrases mean?*

(a) f is continuous at a point X

(b) f is continous on an interval $[a, b]$

(c) f is continous

(d) f has a horizontal asymptote $y = 2$

Problem 2. *Is there a number that is...*

(a) ...exactly two bigger than its square root?

(b) ...exactly twice smaller than its logarithm?

Problem 3. *Find any interesting or useful limits and graph the function:*

(a) $\dfrac{(x+1)^2}{x^2}$

(b) $x^4 - x^5$

(c) $x \sin(x)$

Problem 4. *Come up with a function (for example, temperature at time t) that has...:*

(a) A jump discontinuity.

(b) A vertical asymptote.

(c) A horizontal asymptote.

(d) A point where it is continuous despite oscillations (like $x\sin(\pi/x)$).

Problem 5. *(Will not be on a quiz or test.) Is every function continuous at least somewhere? To rephrase, is there a function that is not continuous at any point?*