L 3.201 For each mathematical function f given below, write a MATLAB function (with a name of your choosing) that takes an $m \times n$ matrix t and returns a matrix x of the same dimensions where $x_{i,j} = f(t_{i,j})$. The MATLAB function is not permitted to use any conditional statements (such as **`if`** statements) or looping constructs (such as **`for`** or **`while`** statements). (For a matrix a, the notation $a_{i,j}$ denotes the element of a in the ith row and jth column.)

(a) $f(t) = \left(\dfrac{t^2-1}{t^2+1}\right) e^{-|t/10|} \cos\left(\dfrac{t}{2\pi}\right)$;

(b) $f(t) = (t^2+1)^{-1} + te^{-|t|}\sin(2t)$;

(c) $f(t) = \begin{cases} \frac{1}{2} & 0 \le \sin(t) < \frac{1}{\sqrt{2}} \\ 1 & \sin(t) > \frac{1}{\sqrt{2}} \\ 0 & \text{otherwise;} \end{cases}$

(d) $f(t) = \text{rect}(t)$;

(e) $f(t) = \text{tri}(t/2) = \begin{cases} 1-|t| & -1 \le t \le 1 \\ 0 & \text{otherwise;} \end{cases}$

(f) $f(t) = \begin{cases} e^t & t < 0 \\ 1 & 0 \le t < 1 \\ e^{1-t} & t \ge 1; \end{cases}$ and

(g) $f(t) = \begin{cases} |\sin(\pi t)| & |t| \le 1 \\ |t|-1 & 1 < |t| \le 2 \\ 1 & \text{otherwise.} \end{cases}$