QUIZ 2 - MATH 111   Friday, September 6

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Read each problem **very carefully** before starting to solve it and do only what is asked.
Each problem is worth around 5 points. It is necessary to show **all** your work. Correct
answers without explanations are worth 0 points. GOOD LUCK!!

1. [4 points] Find the domain of the following functions, showing all your work.

    (a) $f(x) = \dfrac{1}{x^2 + 10x - 24}$

    (b) $g(x) = \sqrt{3 - 17x}$

2. [4 points] In a certain tax system, incomes up to \$50,000 are taxed at the rate of 10%. Any
   additional income (over \$50,000) is taxed at the rate of 20%. Finally, as a special provision
   for the very wealthy, any income exceeding \$100,000 is taxed at the rate of 30%. Write a
   function $T(x)$ giving the income tax owed in terms of the annual income x of an individual
   according to this 3-tier taxation system.

3. [4 points] Consider the piecewise defined function

$$f(x) = \begin{cases} x + 3, & \text{if } x \leq 1, \\ \sqrt{x - 1}, & \text{if } x > 1. \end{cases}$$

Sketch the graph of $y = f(x)$.