1. Find all discontinuous points of the following function and determine removable or non removable type of each of them.

$$f(x) = \begin{cases} \sqrt{1-x} & \text{if } x < 0\\ -2+|x| & \text{if } 0 \le x < 1\\ \frac{x^2-4x}{x-4} & \text{if } x \ge 1 \end{cases}$$
(1)

2. Find the limit.

$$\lim_{x \to 0} \sqrt{x} \sin(\frac{1}{x}) \tag{2}$$

hint: Please note that the for any angle θ we have $-1 \leq \sin(\theta) \leq 1$. Use squeeze theorem and find the answer.

3. Find all vertical and horizontal asymptotes of the following function.

$$f(x) = \frac{4x^2 + 7x - 1}{x^2 - 6x - 16} \tag{3}$$