MATH 210: 9-8 WORKSHEET

(1) Write out the full definition for "$f(x)$ is continuous on the interval I" for all four types of bounded intervals:
- $I = (a, b)$
- $I = [a, b]$
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(2) Consider the piecewise-defined function

$$p(x) = \begin{cases} 2 & \text{if } x < 0 \\ 3 - x & \text{if } 0 < x < 2 \\ x^2 - 4x + 5 & \text{if } 2 < x \end{cases}$$

Explain why $p(x)$ is discontinuous at $x = 0$ and $x = 2$. Classify the type of these two discontinuities.

(3) Compute the limits:

$$\lim_{x \to 3} \sqrt{\frac{x^2 - 9}{x - 3}}$$

$$\lim_{x \to \infty} e^{2 \arctan x}$$