1. (4 points) Find the slope of the secant line of $f(x) = 1 - x^2$ through the points with x values $x_1 = 1$ and $x_2 = 2$.

   Solution: Since $f(3) = -8, f(1) = 0$,

$$m = \frac{f(3) - f(1)}{3 - 1} = -4.$$

2. (3 points) Evaluate the limit: $\lim_{x \to \pi^-} \frac{|x - \pi|}{x - \pi}$.

   Solution: direct substitution gives $\frac{0}{0}$, need to find a way to simplify!

   When $x < \pi$, $|x - \pi| = -(x - \pi)$, so

$$\lim_{x \to \pi^-} \frac{|x - \pi|}{x - \pi} = \lim_{x \to \pi^-} \frac{-(x - \pi)}{x - \pi} = -1.$$

3. (3 points) Find all the vertical asymptotes of the curve $y = \frac{x^3 - 2x^2}{(x^2 - 4x + 4)}$.

   Solution: We first simplify the fraction by factorization $\dfrac{x^3 - 2x^2}{(x^2 - 4x + 4)} = \dfrac{x^2(x - 2)}{(x - 2)^2} = \dfrac{x^2}{x - 2}$.

   Therefore, the vertical asymptote is $x = 2$ as $\lim_{x \to 2^+} \frac{x^2}{x-2} = \infty$ and $\lim_{x \to 2^-} \frac{x^2}{x-2} = -\infty$.