1. (3 pts) Find the integral
\[ \int \frac{\sqrt{1 + x^2}}{x} \, dx \]

2. (3 pts) Write out the form of the partial fraction decomposition of the function
\[ \frac{2}{x^2(x - 1)(x^2 - 4)(x - 3x + 4)^2} \]
without finding the constants.

3. (4 pts) Determine whether the integral is convergent or divergent. Evaluate it if it is convergent.
\[ \int_{-\infty}^{\infty} xe^{-x^2} \, dx \]
Instructions: Show Your Work!

1. (3 pts) Find the integral
\[ \int x \sqrt{1 - x^4} \, dx \]

2. (3 pts) Write out the form of the partial fraction decomposition of the function
\[ \frac{2}{x^2 (x - 1)(x^2 - 4)(x - 3x + 4)^2} \]
without finding the constants.

3. (4 pts) Determine whether the integral is convergent or divergent. Evaluate it if it is convergent.
\[ \int_{1}^{\infty} \frac{e^{-\sqrt{x}}}{\sqrt{x}} \, dx \]