**9.** [3 points] For x > 0, let g(x) be a positive continuous function, and

$$G(x) = \int_x^{e^{x^2}} \frac{1}{g(t)} dt.$$

Find G'(x). Your answer may involve g.

10. [6 points] Compute the radius of convergence of the power series

$$\sum_{n=0}^{\infty} \frac{8^n}{(n+1)^2} x^{3n+1}$$

Be sure to show all your reasoning.

- **11**. [12 points] Let  $f(x) = x(1-x)^{-1/2}$ .
  - **a.** [4 points] Write down the first 3 non-zero terms of the Taylor series for f(x) centered at x = 0. Show your work.
  - **b.** [3 points] Let F(x) be an antiderivative of f(x) such that F(0) = 2. Write down the first 4 non-zero terms of the Taylor series for F(x) centered at x = 0. Show your work.
  - **c.** [5 points] Compute the exact value of  $\int_0^{3/4} f(x) dx$ . Show each step of your computation.