Name ____________________________

- No calculators are allowed.

1. (5 points) Evaluate the following indefinite integrals.

   (a) \( \int dx \)

   (b) \( \int x^r \, dx \) \quad (r \neq -1)

   (c) \( \int \frac{1}{x} \, dx \)

   (d) \( \int \cos x \, dx \)

   (e) \( \int \sin x \, dx \)

   (f) \( \int \sec^2 x \, dx \)

   (g) \( \int \csc^2 x \, dx \)

   (h) \( \int \sec x \tan x \, dx \)

   (i) \( \int \csc x \cot x \, dx \)

   (j) \( \int e^x \, dx \)

   (k) \( \int b^x \, dx \) \quad (0 < b, b \neq 1)

   (l) \( \int \frac{1}{1 + x^2} \, dx \)

   (m) \( \int \frac{1}{\sqrt{1 - x^2}} \, dx \)

   (n) \( \int \frac{1}{x\sqrt{x^2 - 1}} \, dx \)
2. (3 points) Evaluate the following integrals.

(a) \( \int \left( 6x^2 + \sqrt{x} + \frac{3}{x} + 7 \right) \, dx. \)

(b) \( \int \cos^3(x) \sin(x) \, dx. \)

(c) \( \int_0^4 \frac{x}{\sqrt{x^2 + 9}} \, dx \)

3. (2 points) Sketch the graph of \( f(x) = 2 + \sin x \) on the interval \([0, \pi]\) and shade in the area between the \(x\)-axis and this curve on that interval. Now compute the exact area of this shaded region.