1. (a) Evaluate \( \int \frac{x}{\sqrt{4-x^2}} \, dx \).

(b) Rewrite the improper integral \( \int_{-2}^{2} \frac{x}{\sqrt{4-x^2}} \, dx \) using limits, and evaluate.
(22) 2. Evaluate the integrals.

(a) \[ \int x^2 \sin(2x) \, dx \]

(b) \[ \int \sin^2(x) \cos^3(x) \, dx \]
(22) 3. Evaluate the integrals.

(a) \[ \int \frac{x + 1}{x^3 - x^2} \, dx \]

(b) \[ \int \frac{\sqrt{x}}{1 + x} \, dx \]
(11) 4. Evaluate the integral. 
\[ \int \frac{x^2}{(x^2 + 1)^{5/2}} \, dx \]

(11) 5. Using the tables on the last page of the exam, evaluate the integral. Specify which formula you are using.
\[ \int \frac{dx}{e^x \sqrt{16 - e^{2x}}} \]
6. Consider the set of points $P = (x, y)$ such that the distance from $P$ to the point $(0,3)$ is twice the distance from $P$ to the point $(3,0)$.

Show that this set of points is a circle, and find the center and radius of the circle.