Integration: Trig integrals and trigonometric substitution.

You are to provide full solutions to the following problems. You are allowed to collaborate with your classmates, use your notes and textbook and ask the TA for guidance. Direct copying of solutions is not encouraged, nor is it allowed or ethical.

Last name: ______________________  First name: ______________________

Student number: ______________________

(Please indicate your student number on the first page of the solutions, but not you name.)
Integration: Trig integrals and trigonometric substitution.

Please answer the questions requested by the TA on loose leaf and staple them carefully along with the cover page.

1. Evaluate $\int \cos^3 x \sin^6 x \, dx$

2. Evaluate $\int \frac{\cos 4x}{\sin^2 2x} \, dx$

3. Evaluate $\int \frac{\cos (x + 1)}{\cos x} \, dx$

4. Evaluate $\int_0^2 \frac{1}{\sqrt{2} t^3 \sqrt{t^2 - 1}} \, dt$

5. Evaluate $\int \frac{dx}{(x^2 + 1)^2}$

6. Evaluate $\int x^3 \sqrt{9x^2 - 4} \, dx$

7. Evaluate $\int \sqrt{5 + 4x - x^2} \, dx$

8. Find the area of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$, where $a$ and $b$ are constants.