Use the given substitutions to find these antiderivatives.
(problems from Stein & Barcellos, *Calculus & Analytic Geometry*, 5th Ed. New York: McGraw-Hill, 1992)

1. $\int 3(1+3x)^5\,dx$ $\qquad u = 1+3x$

2. $\int e^{\sin x}\cos x\,dx$ $\qquad u = \sin x$

3. $\int \frac{-e^{1/x}}{x^2}\,dx$ $\qquad u = 1/x$

4. $\int \frac{\sin(\ln x)}{x}\,dx$ $\qquad u = \ln x$ $\qquad$ HINT: Remember what $\ln x$ is the **anti**derivative of.

5. $\int \frac{3x}{\sqrt{1-9x^2}}\,dx$ $\qquad u = 1-9x^2$

6. $\int e^{3x}\,dx$ $\qquad u = 3x$

7. $\int x(1-5x^2)^7\,dx$ $\qquad u = 1-5x^2$

Use appropriate substitutions to find these antiderivatives.

8. $\int \frac{x}{\left(x^2+1\right)^3}\,dx$

9. $\int 7x^4\left[\sin\left(x^5\right)\right]dx$

10. $\int \frac{\sin(\ln x)}{x}dx$

11. $\left(\sin x\right)^3\left(\cos x\right)dx$

12. $\int \frac{4x+6}{x^2+3x+2}\,dx$