[Answers to Derivative & Integral Problems, Continued]

Integrals — Substitutions and Hints:

1. Let $u = 1 + 4x^2$.
2. Let $u = 1 + 4x^2$.
3. Let $u = 2x$.
4. Write $4 + x^2 = 4(1 + \frac{x^2}{4})$; let $u = x/2$.
5. Write $3 + x^2 = 3(1 + \frac{x^2}{3})$; let $u = x/\sqrt{3}$.
6. Write $25 - 4x^2 = 25(1 - \frac{4}{25}x^2)$; let $u = \frac{2}{5}x$.
7. Let $u = 25 - 4x^2$.
8. Write $4x^2 - 25 = 25(\frac{4}{25}x^2 - 1)$; let $u = \frac{2}{5}x$.
9. Let $u = 4x^2 - 25$.
10. Let $u = 1 + e^x$.
11. Let $u = e^x$; note $e^{2x} = (e^x)^2$.
12. Let $u = 1 - e^{2x}$.
13. Write $\dfrac{1 + e^x}{e^x} = e^{-x} + 1$.
14. Let $u = 1 + e^x$.
15. Let $u = e^x$; note $e^{2x} = (e^x)^2$.
16. Let $u = 1 + e^{2x}$.
17. Let $u = e^{2x}$; note $e^{4x} = (e^{2x})^2$.
18. Let $u = 1 - \cos^2 x$.
19. Let $u = \cos x$.
20. Let $u = 1 - \cos x$.
21. Let $u = 2\cos x$.
22. Write $9 + \cos^2 x = 9(1 + \frac{1}{9}\cos^2 x)$; let $u = \frac{1}{3}\cos x$.
23. Let $u = \cos^2 x$.
24. Let $u = 1 + \cos^4 x$.