BONUS PROBLEM SET:
INTEGRATION EDITION

<u>Integrate the following:</u>

1. $\int (x^3 + 2)\,dx$

2. $\int \frac{1}{1+x^2}\,dx$

3. $\int \sqrt{x^{\frac{3}{3}}}\,dx$

4. $\int \frac{x}{\sqrt{1-x^4}}\,dx$

5. $\int \left(4x^3 + 7x^2 - \frac{2x}{1-x^2}\right)dx$

6. $\int \left(4 - \sqrt{x}\right)^2 dx$

7. $\int -\frac{dt}{(t+2)^2}$

8. $\int \left(x^{\frac{3}{4}} - 2x^{\frac{1}{2}}\right)dx$

9. $\int 3x^2 (x^3 + 1)^{7\frac{8}{3}}\,dx$

10. $\int x^3 (x^2 + 1)^6\,dx$

11. $\int \left(\frac{x+3}{\sqrt{x+1}}\right)dx$

12. $\int \left(\frac{dx}{\sqrt{x\sqrt{x}+x}}\right)$

13. $\int (\cos t - \sin t)\,dt$

14. $\int \tan x \sec^2 x\,dx$

15. $\int \csc x(\cot x - 3\csc x)\,dx$

16. $\int \left(\frac{2}{\pi}x - 2\sec^2 x\right)dx$

17. $\int \cos^2 \frac{\pi}{2}x \sin \frac{\pi}{2}x\,dx$

18. $\int \cos^2 5x\,dx$

19. $\int \sin^2 3x\,dx$

20. $\int \sec^2 x \tan x\,dx$

21. $\int \left(\frac{\csc^2 2x}{\sqrt{2 + \cot 2x}}\right)dx$

22. $\int \left(\frac{\sin\left(\frac{1}{x}\right)}{x^2}\right)dx$

23. $\int x^2 \tan(x^3 + \pi)\sec^2 (x^3 + \pi)\,dx$

24. $\int (\sin x - x\cos x)^3\,dx$

25. $\int e^{-6x}\,dx$

26. $\int \ln e^x\,dx$

27. $\int x\left(e^{x^2} + 2\right)dx$

28. $\int e^x \sec e^x\,dx$

29. $\int e^{-x}\left[1 + \cos\left(e^{-x}\right)\right]dx$

30. $\int (2^x + x^2)\,dx$

31. $\int e^x \cos(2 - e^x)\,dx$

32. $\int \tan^2 2x\,dx$

33. $\int \sec^4 t\,dt$

34. $\int \frac{x\,dx}{2 + 3x}$

35. $\int x^3 \sin x\,dx$

36. $\int x^3 \ln x\,dx$

37. $\int \left(\frac{e^{\sqrt{x}}}{\sqrt{x}}\right)dx$

38. $\int \cos 2x \sin^3 2x\,dx$

39. $\int e^x \tan e^x$

40. $\int (\sin^3 x + \sin^5 x - \sin^7 x - \tan^7 x)\,dx$