

I'M DOING THIS FOR
CLASS CREDIT!

CLASS _____

SECTION _____

NAME _____

E-MAIL _____

CIRCLE
ONE : GRADUATE
UNDERGRADUATE

INTEGRATION BEE

2009

NO CALCULATORS, BOOKS, HEADPHONES, PERSONAL
ELECTRONIC DEVICES, STOCK OPTIONS, FUNNY T-SHIRTS,
CHEATING

60 MINUTES. CIRCLE ANSWERS. ALL PROBLEMS
COUNT EQUALLY. NO PARTIAL CREDIT. START AND
STOP WHEN TOLD. TAKE ALL "LN" OR "LOG" TO BASE E.

1. $\int x^{2009} dx$

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

$$3. \int \frac{1}{x^{1/4}} dx$$

$$4. \int \frac{1}{x^{1/2} + x^{1/4}} dx$$

$$5. \int \frac{1}{x^4 + 1} dx$$

$$6. \int x^2 dx$$

$$7. \int e^x dx$$

$$8. \int x^2 e^x dx$$

$$9. \int \sin 20x \, dx$$

$$10. \int \cos 9x \, dx$$

$$11. \int \sin 20x \cos 9x \, dx$$

$$12. \int \frac{1}{1+2009\sin^2 x} \, dx$$

$$13. \int \frac{1}{2+3x^2} \, dx$$

$$14. \int \frac{4x}{5+6x^2} \, dx$$

$$15. \int \frac{7x^2}{8+9x^2} \, dx$$

$$16. \int \sec x \, dx$$

$$17. \int \sec^2 x \, dx$$

$$18. \int \sec^3 x \, dx$$

$$19. \int x (1 + 2009x)^{2009/2} \, dx$$

$$20. \int \tan^3 x \, dx$$

$$21. \int \tan^4 x \, dx$$

$$22. \int \tan^5 x \, dx$$

DUE TO BUDGET CUTS, THIS YEAR'S INTEGRATION BEE WILL ALSO FEATURE DERIVATIVES

$$23. \frac{d}{dx} \sqrt[3]{x}$$

$$24. \frac{d}{dx} \sqrt{x}$$

$$25. \frac{d}{dx} \sin^{\sin x} x$$

$$26. \frac{d}{dx} \ln^{\ln x} x$$

$$27. \frac{d}{dx} \frac{1}{1 + \frac{1}{1 + \frac{1}{x}}}$$

$$28. \frac{d}{dx} \sqrt{1 + \left(\frac{1}{x}\right)^2}$$

$$29. \frac{d}{dx} \frac{1}{\ln x}$$

$$30. \frac{d}{dx} \tan x$$

$$31. \frac{d}{dx} \tan(\tan x)$$

$$32. \frac{d}{dx} \tan(\tan(\tan x))$$

$$33. \frac{d}{dx} \sin^2 \sqrt{x}$$

$$34. \frac{d}{dx} \ln^{\sqrt{x}} e$$

$$35. \frac{d}{dx} \cos^{-1}(\cos^{-1} x)$$

$$36. \frac{d}{dx} \text{pwnd}$$

OK, BACK TO INTEGRALS

$$37. \int \frac{a \, da}{\sqrt{b+x^2}}$$

$$38. \int \frac{a \, db}{\sqrt{b+x^2}}$$

$$39. \int \frac{a \, dx}{\sqrt{b+x^2}}$$

$$40. \int \text{RAINDRAIN}$$

$$41. \int x^{0.001} \, dx$$

$$42. \int x^{0.000} \, dx$$

$$43. \int x^{-0.001} \, dx$$

$$44. \int \frac{\sin x}{1 + \cos x} dx$$

$$45. \int \frac{x + \sin x}{1 + \cos x} dx$$

$$46. \int \frac{x}{1 + \cos x} dx$$

$$47. \int x^{2009} \log x dx$$

$$48. \int (e^x - 1) dx$$

$$49. \int (e^x - 1)^3 dx$$

$$50. \int (e^x - 1)^{-1} dx$$