

2012 Integration Bee Solutions

int1. $2 \log(\sqrt{x} - 1) + 2\sqrt{x}$

int2. $(4x^{5/4} \log(x))/5 - 16x^{5/4}/25$

int3. $2(\sqrt{x} - 1)/\sqrt{1 - x}$

int4. $-(9\sqrt[4]{x} + 1)/(18(\sqrt[4]{x} + 1)^9)$

int5. $\pi/4$

int6. $\sin^{-1}((x + 2)/\sqrt{5})$

int7. $1/12$

int8. 1

int9. 1005

int10. $2 \tan^{-1} \sqrt{x + \frac{1}{x} + 1}$

int11. $33/2 - 24 \log(2)$

int12. $\sin(x) \log(x)$

int13. $\log \sqrt{1 - 1/x^2}$

int14. $1/2 - \pi\sqrt{3}/12$

int15. $1/10100$

int16. $4/3$

int17. $6x^{1/6} - 6 \tan^{-1}(x^{1/6})$

int18. $(\log(x + \sqrt{x^2 - 1/2}))/\sqrt{2}$

int19. $2 \tan^{-1} \sqrt{e^x - 1}$ or $-2 \sin^{-1} e^{-x/2}$

int20. $\frac{1}{4} \tan^{-1}(x^2/2)$

int21. $(\cos(x) + \sin(x))/(\cos(x) - \sin(x))$ or $\tan(x + \pi/4)$

int22. $\log \tanh(x/2) - x / \sinh(x)$

int23. $1192/45$

int24. $\log 8 = 3 \log 2$

int25. $2\sqrt{\sin(x)}$