2013 MIT Integration Bee Qualifying Round

1 $\displaystyle\int \log(x^2) - 2\log(2x)\,dx$

2 $\displaystyle\int_{-1}^{3} e^{|x|}\,dx$

3 $\displaystyle\int \frac{(\log x)(\cos x) - (\sin x)(1/x)}{(\log x)^2}\,dx$

4 $\displaystyle\int_{1}^{11} x^3 - 3x^2 + 3x - 1\,dx$

5 $\displaystyle\int_{0}^{2} \sqrt{12 - 3x^2}\,dx$

6 $\displaystyle\int_{0}^{6} x + (x-3)^7 + \sin(x-3)\,dx$

7 $\displaystyle\int \sin x \sqrt{1 + \tan^2 x}\,dx$

8 $\displaystyle\int \frac{x^5 - x^3 + x^2 - 1}{x^4 - x^3 + x - 1}\,dx$

9 $\displaystyle\int_{0}^{1} \log x\,dx$

10 $\displaystyle\int \frac{1}{1 - e^{-x}}\,dx$

11 $\displaystyle\int_{0}^{\pi} \sin^2 x \cos^2 x\,dx$

12 $\displaystyle\int_{0}^{441} \frac{\pi \sin(\pi\sqrt{x})}{\sqrt{x}}\,dx$

13 $\displaystyle\int \tan^2 x\,dx$

14 $\displaystyle\int_{0}^{256} (x - \lfloor x \rfloor)^2\,dx$

15 $\displaystyle\int e^{\sqrt[4]{x}}\,dx$

16 $\displaystyle\int \cos x \cot x\,dx$

17 $\displaystyle\int 2\log x + (\log x)^2\,dx$

18 $\displaystyle\int \frac{x^3}{1 + x^2}\,dx$

19 $\displaystyle\int \frac{1}{2 - 2x + x^2}\,dx$

20 $\displaystyle\int \sin x \log(\sin x)\,dx$

21 $\displaystyle\int \frac{x}{1 - x^4}\,dx$

22 $\displaystyle\int \sqrt{12 - 3x^2}\,dx$

23 $\displaystyle\int \sec^5 x \tan^3 x\,dx$

24 $\displaystyle\int_{-\pi/4}^{\pi/4} \frac{1}{1 - \sin x}\,dx$

25 $\displaystyle\int \frac{1}{x\sqrt{x^2 - 2}}\,dx$