Integration Bee Answer Key

HMMT November 2024

Qualifiers

1. 2024^2
2. 2024
3. 1
4. $\dfrac{\arctan 2^x}{\log 2}$
5. $\dfrac{(x^2-1)^{101}}{101}$
6. $-\log(\cos(\tan x))$
7. $\dfrac{1}{2}(1+e^{\pi})$
8. $-2+\dfrac{\pi}{2}+\ln 2$
9. 1
10. $\dfrac{16}{15}$
11. $\dfrac{3}{5}((x+1)^{5/3}+x^{5/3})$
12. $\dfrac{2}{\log 2}$
13. $(x\log x-x)\log\left(\dfrac{x\log x-x}{e}\right)$
14. $\dfrac{\pi^2}{4}$
15. $\dfrac{1}{12}$
16. $-\dfrac{x}{x^2-2}$
17. $x-\dfrac{e^x-e^{-x}}{e^x+e^{-x}}$
18. $\dfrac{\pi^2}{6}$
19. $e^x\tan\left(\dfrac{x}{2}\right)$
20. 7.954926521

©2024 HMMT

Integration Bee Answer Key

HMMT November 2024

Finals

Sample

[1] 1012

[2] $\frac{1}{2025}$

Semifinal 1

[1] $x \tan x - \log \sec x$

[2] $\frac{3\pi}{2} - 4$

[3] $25! - 1$

Semifinal 2

[1] $2(-\sqrt{x+1} + \sqrt{x})$

[2] $\frac{8(1+\sqrt{2})}{15}$

[3] $2 - \frac{\pi}{2}$

Audience Round

[1] -1.5

Final

[1] 1

[2] 0

[3] 174

[4] 2

[5] $\frac{4+\pi}{\sqrt{2}}$

Sudden Death

[1] $x^{\log x + 1}$

[2] $\frac{125}{12}$

[3] $2x(\log x)^{3/2}$

[4] 2π

[5] $\frac{\log 4 - 1}{\log^3 2}$

©2024 HMMT