SwInBee 2024

Name: _____ **Submission time:** _____ **Score:** _____

Instructions

1. Duration: 50 minutes.
2. Record your answers on this answer sheet.
3. No materials allowed besides pens and pencils. Paper will be supplied for rough working.
4. No partial marks awarded. This includes the "+ C" for indefinite integrals: if an appropriate constant is not included then you will get zero.
5. In the event of papers achieving the same score, the tie-breaker will be the order of submission, with earlier papers ranked higher.

Integrals

1. $\int \sin(2x)\cos(2x)\,dx$

2. $\int x\,7^{x^2}\,dx$

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

4. $\int \dfrac{dx}{1+\sqrt{x}}$

5. $\int \dfrac{\sqrt{x^2-1}}{x}\,dx$

6. $\int x\,dy$

7. $\int \dfrac{dx}{5-3\cos^2(x)}$

8. $\int \dfrac{4x+1}{1+x^2}dx$

9. $\int \sin^2 x \, \cos^2 x \, dx$

10. $\int \frac{4x}{\exp(2x+3)} dx$

11. $\int \frac{2x^3}{5+3x^2} dx$

12. $\int \frac{dx}{\sqrt{x^2-2024}}$

13. $\int \frac{dx}{x\sqrt{x^2-1}}$

14. $\int \frac{\sqrt{x}}{\sqrt{x}-\sqrt[3]{x}} \, dx$

15. $\int_{-\pi}^{\pi} x^{11} \sin^3(x^2) \, dx$

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

17. $\int xe^x \cos x \, dx$

18. $\int \frac{(\sin x - \cos x)(\sin x + \cos x)}{\sin x \cos x} \, dx$

19. $\int \frac{\ln x}{x} \, dx$

20. $\int_0^1 \frac{x^4(1-x)^4}{1+x^2} \, dx$