

Honors Math 182 Exam 1 Version B

1. Solve the following indefinite integrals:

(i) $\int (x^7 + 7^x) dx$

(ii) $\int \frac{1}{\sqrt{4+x^2}} dx$

(iii) $\int x \ln(3x) dx$

(iv) $\int x\sqrt{x+8} dx$

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2. Solve the following definite integrals:

(i) $\int_0^2 |x - 1| dx$

(ii) $\int_0^1 \frac{e^x}{4 + e^{2x}} dx$

(iii) $\int_0^2 \frac{1}{x^2 + 3x + 2} dx$

(iv) $\int_0^{\pi/6} (\sin 2x)(\cos x) dx$

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3. Find the following derivatives:

(i) $\frac{d}{dx} \ln(1 + \cos^2 x)$

(ii) $\frac{d}{dx} \ln \sqrt{\frac{9 + x^2}{9 - x^2}}$

(iii) $\frac{d}{dx} |\arctan x|^3$

(iv) $\frac{d}{dx} \frac{\cosh 2x}{x}$

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4. State and prove the integration by parts formula for definite integrals.

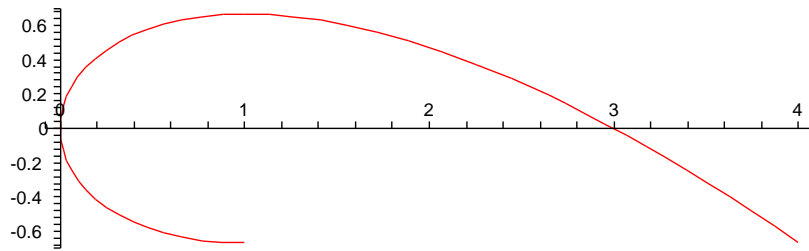
5. Make the substitution $u = \ln x$ in the following integrals, but DO NOT SOLVE THEM!

(i) $\int_1^e x \, dx$

(ii) $\int_2^4 \frac{\sin x}{\ln x} \, dx$

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6. Find the length of the curve



given by $(f(t), g(t))$ where t ranges over $[-1, 2]$ and $f(t) = t^2$ and $g(t) = t - \frac{1}{3}t^3$.