

## Calculus 1 - Homework 2

A) Choose and evaluate at least 8 of the following integrals.

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|-------------------------------------|--|
| 1) $\int \frac{2x+5}{x-3} dx$       | 2) $\int \frac{x^3}{(x+1)^{10}} dx$              |
| 3) $\int \cos(\sqrt{x}) dx$         | 4) $\int \frac{\sqrt{1+\ln x}}{x \ln x} dx$      |
| 5) $\int \frac{1}{e^x - e^{-x}} dx$ | 6) $\int \frac{1}{\sqrt{x+1} + \sqrt{x}} dx$     |
| 7) $\int \frac{1+e^x}{1-e^{-x}} dx$ | 8) $\int \frac{x}{(x^2+1)(x^2+4)} dx$            |
| 9) $\int \sin^2 x \cos^3 x dx$      | 10) $\int x^2 \ln(1+x) dx$                       |
| 11) $\int \ln(1+x^2) dx$            | 12) $\int \frac{\arctan(\sqrt{x})}{\sqrt{x}} dx$ |
| 13) $\int \frac{x^3+1}{x^3-x^2} dx$ | 14) $\int \frac{\sqrt{x}}{1+\sqrt[3]{x}} dx$     |

B) Choose and evaluate at least 8 of the following integrals.

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|--|---|---|
| 1) $\int_0^\pi (2x+1) \cos(x+\pi) dx$    | 2) $\int_2^3 \frac{x}{(x-1)^3} dx$                  | 3) $\int_1^4 \frac{x+5}{\sqrt{x+1}} dx$     |
| 4) $\int_0^1 e^{x+2} \cos(e^x + \pi) dx$ | 5) $\int_0^\pi 2 \sin^2\left(\frac{x}{2}\right) dx$ | 6) $\int_0^1 (2x-5) \ln(x+1) dx$            |
| 7) $\int_0^2 \frac{4x+5}{x^2+1} dx$      | 8) $\int_0^1 \frac{2x^3-3x^2+1}{x^2+16} dx$         | 9) $\int_1^3 \frac{2x^2+2}{x^3+2x^2+2x} dx$ |
| 10) $\int_0^\pi \sin^3(x) dx$            | 11) $\int_2^5 \frac{5}{\sqrt{x-1}+2} dx$            | 12) $\int_0^2 (x- x-1 )e^x dx$              |

C) Choose and evaluate at least 8 of the following improper integrals.

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|--|---|--|
| 1) $\int_0^\infty \frac{-1}{(x+2)(x+1)} dx$          | 2) $\int_{-\infty}^\infty \frac{1}{1+x^2} dx$ | 3) $\int_1^{+\infty} e^{-2x-3} dx$               |
| 4) $\int_0^1 \frac{1}{x^2-2x} dx$                    | 5) $\int_3^\infty \frac{1}{x^2-2x} dx$        | 6) $\int_0^\infty \frac{1}{x^2-2x} dx$           |
| 7) $\int_0^\infty \frac{1}{x^2} e^{-\frac{1}{x}} dx$ | 8) $\int_0^\infty \frac{1}{x^2-2x+5} dx$      | 9) $\int_3^\infty \frac{1}{x^2-x-2} dx$          |
| 10) $\int_0^\infty \frac{e^x}{e^{2x}+1} dx$          | 11) $\int_0^\infty \frac{1}{e^x+1} dx$        | 12) $\int_0^{\frac{\pi}{2}} \frac{1}{\sin x} dx$ |
| 13) $\int_{-\infty}^{-1} \frac{1}{x\sqrt{1-x}} dx$   | 14) $\int_{-1}^1 \frac{1}{x^2-2 x +1} dx$     | 15) $\int_{-\infty}^0 \frac{e^x}{e^x+3} dx$      |
| 16) $\int_0^4 \frac{1}{\sqrt{x}(1+x)} dx$            | 17) $\int_0^{+\infty} x e^{-2x} dx$           | 18) $\int_0^{+\infty} (\sin x) e^{-x} dx$        |