

Homework #9**Due Friday, October 1st** in Gradescope by 11:59 pm ET

Goal: Exploring Improper Integrals, for both Type I (unbounded domain) and Type II (unbounded range). We will need IBP, Complete the Square, Partial Fractions, and some u-sub here. We may also need L'Hôpital's Rule to finish a few of the limits at hand.

Compute each of the following Integrals. Simplify when possible.

1. $\int_{-\infty}^0 \frac{1}{3-4x} dx$

2. $\int_1^{\infty} \frac{1}{(2x+1)^3} dx$

3. $\int_2^{\infty} \frac{x}{e^{3x}} dx$

4. $\int_e^{\infty} \frac{\ln x}{x^3} dx$

5. $\int_e^{\infty} \frac{1}{x(\ln x)^2} dx$

6. $\int_e^{\infty} \frac{1}{x \ln x} dx$

7. $\int_{-\infty}^7 \frac{1}{x^2 - 4x + 29} dx$

8. $\int_6^{\infty} \frac{6}{x^2 - 4x - 5} dx$

9. $\int_0^5 \frac{6}{x^2 - 4x - 5} dx$ Can reuse PFD work in 8

10. $\int_1^2 \frac{1}{x \ln x} dx$

11. $\int_0^1 x \ln x dx$

12. $\int_{-2}^3 \frac{1}{x^4} dx$

13. $\int_{-\infty}^{\infty} \frac{1}{x^2 + 2x + 5} dx$

REGULAR OFFICE HOURS

Monday: 1:00–3:00 pm

9–10:30 pm TA Mia, SMUDD 207

Tuesday: 12:00–4:00 pm

6–7:30 pm TA Ian, SMUDD 207

7:30–9:00 pm TA Karime, SMUDD 207

Wednesday: 1:00–3:00 pm

6–7:30 pm TA Ian, SMUDD 207

7:30–9:00 pm TA Daksha, SMUDD 207

Thursday: none for Professor

1–2:30 pm TA Mia, SMUDD 207

7:30–9:00 pm TA Daksha, SMUDD 207

Friday: 12:00–2:00 pm

2:30–4:00 pm TA Karime, SMUDD 014**

You are welcome at Office Hours all the time. *Please come!*