

Homework #8Due **FRIDAY, March 3rd** in Gradescope by 11:59 pm ET**Goal:** Warm-Up Algebra for future Area ComputationsFor problems 1-6, i and n are some constants. Simplify, combine similar variables.

1. Consider $f(x) = 6x + 5$. Compute $f\left(\frac{4i}{n}\right)$

2. Consider $f(x) = 6x + 5$. Compute $f\left(-2 + \frac{3i}{n}\right)$

3. Consider $f(x) = x^2 - 6x - 7$. Compute $f\left(\frac{4i}{n}\right)$

4. Consider $f(x) = x^2 - 6x - 7$. Compute $f\left(5 + \frac{2i}{n}\right)$

5. Consider $f(x) = x^2 - 5x - 4$. Compute $f\left(\frac{3i}{n}\right)$

6. Consider $f(x) = x^2 - 5x - 4$. Compute $f\left(-4 + \frac{5i}{n}\right)$

For problems 7-18, Evaluate each of the Limits. You may need to use algebra to decompose the Limit into simpler pieces. Also use *arrows* to show the size arguments, either growing large towards ∞ and/or small towards 0.

7. $\lim_{n \rightarrow \infty} 8$

8. $\lim_{n \rightarrow \infty} \frac{1}{n}$

9. $\lim_{n \rightarrow \infty} \frac{6}{n}$

10. $\lim_{n \rightarrow \infty} \frac{n+4}{n}$

11. $\lim_{n \rightarrow \infty} \frac{2n+1}{n}$

12. $\lim_{n \rightarrow \infty} \frac{n(n+4)}{n^2}$

13. $\lim_{n \rightarrow \infty} \frac{n(n+1)(4n+1)}{n^3}$

14. $\lim_{n \rightarrow \infty} \frac{6}{n^2} \left(\frac{n(n+1)}{2} \right)$

15. $\lim_{n \rightarrow \infty} \frac{9}{n^3} \left(\frac{n(n+1)(2n+1)}{6} \right)$

16. $\lim_{n \rightarrow \infty} \frac{15}{n^3} \left(\frac{n(n+1)(2n+1)}{6} \right)$

17. $\lim_{n \rightarrow \infty} \frac{36}{n^3} \left(\frac{n(n+1)(2n+1)}{6} \right) - \frac{100}{n^2} \left(\frac{n(n+1)}{2} \right) + \left(\frac{7}{n} \right) n$

18. $\lim_{n \rightarrow \infty} \frac{24}{n^3} \left(\frac{n(n+1)(2n+1)}{6} \right) - \frac{42}{n^2} \left(\frac{n(n+1)}{2} \right) + \left(\frac{5}{n} \right) n$

REGULAR OFFICE HOURS

Monday: None this week

Tuesday: None this week

7:30–9:00 pm TA Ellerman, SMUDD 204

Wednesday: None this week

Thursday: TBA

7:30–9:00 pm TA Ellerman, SMUDD 207

Friday: 12:00–2:00 pm

- Present Final Drafts only please
- Justify all details, and show all steps