

## HW #12 Final Answers

1. Diverges      Note:  $\int_1^{\infty} \frac{1}{x} dx = \dots = \infty$
2. Converges      Note:  $\int_1^{\infty} \frac{1}{x^3} dx = \dots = \frac{1}{2}$
3. Diverges      Note:  $\int_2^{\infty} \frac{1}{x \ln x} dx = \dots = \infty$
4. Converges      Note:  $\int_1^{\infty} \frac{x}{e^x} dx = \dots = \frac{2}{e}$
5. Converges      Note:  $\int_1^{\infty} \frac{1}{x^2+4} dx = \dots = \frac{1}{2} \left( \frac{\pi}{2} - \underbrace{\arctan\left(\frac{1}{2}\right)}_{\text{Finite}} \right)$
6. Converges
7. Diverges
8. Diverges
9. Converges
10. Converges
11. Diverges
12. Converges
13. Converges
14. Diverges
15. Diverges
16. Converges