

# 1552 Homework Checks 3: Questions

June 21, 2023

## 1 Question 1: Improper Integral

Evaluate the improper integrals if they converge, or show that the integral diverges.

(Hint1: Evaluation of improper integrals should have limits - any solution without limits will not receive credit.

Hint2: Use L'Hopital's rule whenever applicable)

1.  $\int_0^{\infty} x^2 e^{-x} dx$
2.  $\int_0^4 \frac{x}{(x^2-1)^{2/3}} dx$

## 2 Question 2: Sequences

For the sequence below,

- (a) find the l.u.b. and g.l.b.
- (b) determine if the sequence is monotonic
- (c) find the limit of the sequence
- (d) determine whether the sequence converges or diverges.

1.  $\left\{ \frac{n+1}{2n} \right\}$

2.  $\left\{ (-1)^n \frac{1}{5^n} \right\}$