

5. [7 points] Determine whether the following improper integral converges or diverges and circle the corresponding word. **Fully justify** your answer including using **proper notation** and showing mechanics of any tests you use. You do not need to calculate the value of the integral if it converges.

$$\int_2^\infty \frac{x+1}{5x^3 + 3x^3 \sin x} dx$$

*Circle one:*

**Converges**

**Diverges**

*Justification:*