

Determine whether each of the following improper integrals converges or diverges.

1. $\int_2^{\infty} \frac{1}{x^3 + 2} dx$

2. $\int_5^{\infty} \frac{1}{\sqrt{x} - 2} dx$

3. $\int_2^{\infty} \frac{2}{\sqrt{x} + x^2} dx$

4. $\int_0^2 \frac{2}{\sqrt{x} + x^2} dx$

5. $\int_0^{\infty} \frac{2}{\sqrt{x} + x^2} dx$