

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