

For the following determine whether the integral converges or diverges. You do not need to compute its value.

1. $\int_0^1 x \ln x \, dx$

2. $\int_0^5 \frac{1}{\sqrt[3]{5-x}} \, dx$

3. $\int_0^{\pi/2} \frac{\cos \theta}{\sqrt{\sin \theta}} \, d\theta$

4. $\int_0^5 \frac{1}{\sqrt[3]{5-x}} \, dx$

5. $\int_{-1}^2 \frac{x \, dx}{(x+1)^2}$

6. $\int_0^1 \frac{\sec^2 x}{\sqrt{x}} \, dx$

7. $\int_0^1 \frac{dx}{\sqrt{1-x^2}}$

8. $\int_0^\infty \frac{x+1}{\sqrt[4]{x^4-x}} \, dx$

9. $\int_1^\infty \frac{\sin^2 x}{x^3 \sqrt{x-1}} \, dx$

10. $\int_2^{10} \frac{4}{(x-3) \ln(x-10)} \, dx$

11. $\int_1^\infty \frac{1}{(x-5)^{1/4} \sqrt{|x-10|}} \, dx$

12. $\int_{-\infty}^\infty x^{2/3} e^{-x^2} \, dx$