

## Improper Integrals- HW Problems

Determine if the following integrals are convergent or divergent.

Evaluate the convergent integrals.

1. 
$$\int_1^{\infty} \frac{1}{x^2} dx$$

2. 
$$\int_0^{\infty} \frac{1}{\sqrt[3]{1+x}} dx$$

3. 
$$\int_{-1}^1 \frac{x^2}{\sqrt{1+x^3}} dx$$

4. 
$$\int_{-\infty}^{\infty} 2xe^{-x^2} dx$$

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

6. 
$$\int_0^4 \left(2 + \frac{1}{(x-2)^2}\right) dx$$

7. 
$$\int_0^4 \left(2 + \frac{1}{x-2}\right) dx$$

8. 
$$\int_{-\infty}^{\infty} \frac{x^3}{1+x^4} dx$$

9. 
$$\int_1^{\infty} \frac{\ln(x)}{x} dx$$

10. 
$$\int_2^{\infty} \frac{1}{x(\ln(x))^2} dx$$

Use the comparison theorem to determine if the integral converges or diverges.

$$11. \int_1^{\infty} \frac{x^3}{1+x^5} dx$$

$$13. \int_0^{\frac{\pi}{4}} \frac{\sec^2 x}{(x)(\sqrt[3]{x})} dx$$

$$12. \int_1^{\infty} \frac{1+e^{-x^2}}{x} dx$$

$$14. \int_0^{\frac{\pi}{2}} \frac{\cos^4 x}{\sqrt{x}} dx$$