

1) Which of the following is not an improper integral? (circle all that apply)

$$\int_{-4}^2 \frac{1}{x+2} dx$$

$$\int_{-\infty}^1 \frac{1}{x-2} dx$$

$$\int_{-2}^2 \frac{1}{x^2-2} dx$$

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

$$\int_0^{\infty} \frac{1}{x+2} dx$$

$$\int_{-\infty}^{\infty} \frac{1}{x^2+2} dx$$

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

$$\int_{-2}^2 \frac{1}{x-2} dx$$

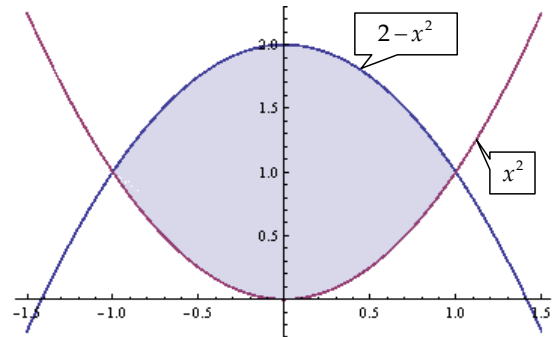
2) Determine whether each of the following definite integrals converges or diverges. Support your answer.

a) $\int_0^{\infty} \frac{1}{x} dx$

b) $\int_0^{\infty} \frac{1}{e^x} dx$

c) $\int_0^{\infty} \frac{1}{x+e^x} dx$ (hint: use the Comparison Theorem)

3) Consider the region bounded by the graphs of $2-x^2$ and x^2 between $x = -1$ and $x = 1$, shown to the right. a) Write down the definite integral or integrals which will allow you to find the area of the region bounded by the graphs. b) Evaluate the integral(s) to determine the area of the region shown.



4) Consider the region bounded by the graphs of $\cos x$ and $\sin x$ between $x = 0$ and $x = 5\pi/4$, shown to the right. a) Write down the definite integral or integrals which will allow you to find the area of the region bounded by the graphs. b) If you have time, evaluate the integral(s) to determine the area of the region shown.

