

7.6 Improper Integrals

Name:

Date:

P 5. Evaluate the integral, if it converges.

$$\int_1^{\infty} \frac{1}{5x+2} dx$$

P 7. Evaluate the integral, if it converges.

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

P 9. Evaluate the integral, if it converges.

$$\int_0^{\infty} x e^{-x^2} dx$$

P 11. Evaluate the integral, if it converges.

$$\int_1^{\infty} \frac{x}{e^x} dx$$

P 19. Evaluate the integral, if it converges.

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

P 23. Evaluate the integral, if it converges.

$$\int_2^{\infty} \frac{dx}{x \ln x}$$

P 31. Evaluate the integral, if it converges.

$$\int_7^{\infty} \frac{dy}{\sqrt{y-5}}$$

P 34. Find a formula for

$$f(x) = \int_{-\infty}^x e^t dt$$

not involving integrals.

P 39. Evaluate $f(3)$.

$$f(x) = \int_1^{\infty} t^{-x} dt$$

P 42. For $\alpha > 0$, calculate

(a) $\int_0^{\infty} \frac{e^{-y/\alpha}}{\alpha} dy$

(b) $\int_0^{\infty} \frac{ye^{-y/\alpha}}{\alpha} dy$

(c) $\int_0^{\infty} \frac{y^2 e^{-y/\alpha}}{\alpha} dy$

P 45. Give that $\int_{-\infty}^{\infty} e^{-x^2} dx = \sqrt{\pi}$, calculate the exact value of

$$\int_{-\infty}^{\infty} e^{-(x-a)^2/b} dx.$$