

For 1 – 3, integrate by substitution.

1.  $\int \sqrt{2-3x} \, dx$

2.  $\int \frac{x^2}{(x^3-1)^{1/2}} \, dx$

3.  $\int \frac{x^{3/2}}{x^{5/2}+2} \, dx$

For 4 – 7, integrate by parts.

4.  $\int x e^{x/2} \, dx$

5.  $\int x \ln 3x \, dx$

6.  $\int x(\ln x)^2 dx$

7.  $\int \frac{\ln x}{x^2} dx$

8. Evaluate the definite integral.

$$\int_{-2}^2 e^{-7x/2} dx$$

9. Solve the differential equation below with the boundary condition that  $y = -1$  when  $x = 3$ .

$$\frac{dy}{dx} = x^2 + 2x + 1$$

10. Find the area enclosed by the graphs of the functions  $f(x) = 2x^2$  and  $g(x) = 2x + 4$

