1. Find Indefinite Integrals

a. $\int 3x+1 \, dx$

b. $\int \frac{1}{x^2} \, dx$

c. $\int \frac{1}{x+1} \, dx$

d. $\int \frac{1}{x^2-5x+6} \, dx$

e. $\int -\sec^2 x \, dx$

f. $\int |x-2| \, dx$

g. $\int \cos^2 \frac{x}{2} \, dx$

h. $\int 3x \cdot \sqrt{x^2+1} \, dx$

2. Calculate the area under the following curve.

a. $f(x) = 1 - x^2$ over $[0, 1]$

b. $f(x) = x + x^2$ over $[0, 1]$

c. $f(x) = \sqrt{3-x^2}$ over $[0, \sqrt{3}]$

3. Find the definite Integrals

a. $\int_1^{\sqrt{2}} x \, dx$

b. $\int_2^1 1 + \frac{x}{2} \, dx$

c. $\int_0^2 |2-x| \, dx$

d. $\int_{-2}^2 \sqrt{4-x^2} \, dx$

e. $\int_3^1 5 \, dx$

f. $\int_0^{\pi} \sin x \, dx$

g. $\int_0^{\frac{\pi}{3}} \sec x \tan x \, dx$

h. $\int_{-3}^3 x \cdot \sin x^2 + 2x^2 \, dx$