

1.) Determine the following indefinite integrals.

a.) $\int \sec^2 x \cdot e^{1+\tan x} dx$

b.) $\int \frac{\sec x \tan x}{e^{3 \sec x}} dx$

c.) $\int e^{-x} \cos^2(e^{-x}) dx$

d.) $\int (e^x \cos x - e^x \sin x) dx$

e.) $\int \sin(e^{\tan(3+x^2)}) \cdot e^{\tan(3+x^2)} \cdot \sec^2(3+x^2) \cdot 2x dx$

2.) Find the average value of the function $f(x) = \frac{e^{\sqrt{x}}}{\sqrt{x}}$ for $x = 4$ to $x = 9$.

3.) Determine the following indefinite integrals.

a.) $\int \frac{1}{3 + \sqrt{x}} dx$

b.) $\int \frac{\sqrt{x}}{4 + \sqrt{x}} dx$

c.) $\int \frac{1 + x^{1/3}}{2 + x^{1/3}} dx$

d.) $\int \frac{1}{\sqrt{x}(1 + \sqrt{x})} dx$

e.) $\int \frac{\sqrt{x}}{1 - x^{1/4}} dx$

f.) $\int \sqrt{1 - \sqrt{x}} dx$

g.) $\int \sqrt{2 + \sqrt{1 + \sqrt{x}}} dx$