

Math 2215 - Calculus 1

Quiz #14 - 2005.12.05

Solutions

1. Compute the following indefinite integral:

$$\int \frac{\cos(x)}{\sqrt{1+3\sin(x)}} dx$$

Letting $u = 1 + 3\sin(x)$ gives $du = 3\cos(x)dx$ or $\cos(x)dx = \frac{du}{3}$. The integral becomes

$$\int \frac{\cos(x)}{\sqrt{1+3\sin(x)}} dx = \frac{1}{3} \int \frac{du}{\sqrt{u}} = \frac{2}{3} \sqrt{u} + C.$$

Thus

$$\int \frac{\cos(x)}{\sqrt{1+3\sin(x)}} dx = \frac{2}{3} \sqrt{1+3\sin(x)} + C.$$

2. Compute the following definite integral:

$$\int_0^\pi e^{\cos(x)} \sin(x) dx$$

Setting $u = \cos(x)$, then $du = -\sin(x)dx$. We now have

$$\int_0^\pi e^{\cos(x)} \sin(x) dx = - \int_1^{-1} e^u du = \int_{-1}^1 e^u du = e - \frac{1}{e}.$$

3. If someone asks you ‘What floats on water?’, how might you respond?

Apples
Very small rocks
Cider
Gravy
Cherries
Mud
Churches
Lead
A duck