oct_19_coding_prob

October 25, 2023

[ ]:
```
from scipy.integrate import quad
import numpy as np

def f1(x):
  return x**2

x1 = 0
x2 = 2

f1_integral_value, f1_error_estimate = quad(f1, x1, x2)


def f2(x):
  return (-x**2)+8

x3 = np.sqrt(8)

f2_integral_value, f2_error_estimate = quad(f2, x2, x3)

def f3(x):
  return x*(f1(x))

f3_integral_value, f3_error_estimate = quad(f3, x1, x2)


def f4(x):
  return x*(f2(x))

f4_integral_value, f4_error_estimate = quad(f4, x2, x3)

a1 = f3_integral_value/f1_integral_value
a2 = f4_integral_value/f2_integral_value

a = ((a1*f1_integral_value) + (a2*f2_integral_value))/(f1_integral_value +␣
 ↪f2_integral_value)

print(f"a is approximately {a}")
```

```
def fy(y):
  return y * (np.sqrt(8-y) - np.sqrt(y))

y0 = 0
y1 = 4

fy_integral_value, fy_error_estimate = quad(fy, y0, y1)

b = (fy_integral_value)/(f1_integral_value + f2_integral_value)

print(f"b is approximately {b}")
```

```
a is approximately 1.8106601717798207
b is approximately 1.268629150121589
```