notes__2020__10__21

October 30, 2020

1 MATH 210 Introduction to Mathematical Computing

1.1 October 21, 2020

```
[1]: import numpy as np
```

1.2 Riemann sums

$$\int_0^{\pi/2} \cos(x)dx = 1$$

```
[2]: a = 0; b = np.pi/2; N = 1000;
dx = (b - a)/N
x = np.linspace(a,b,N+1)
x_right = x[1:]
fx = np.cos(x_right)
approx = np.sum(fx*dx)
print(approx)
```

```
0.9992143962198358
```

$$\int_0^1 \frac{1}{\sqrt[3]{1+x}}dx$$

```
[3]: a = 0; b = 1; N = 17;
dx = (b - a)/N
x = np.linspace(a,b,N+1)
x_right = x[1:]
fx = 1/(1 + x_right)**(1/3)
approx = np.sum(fx*dx)
print(approx)
```

```
0.8750919037191298
```