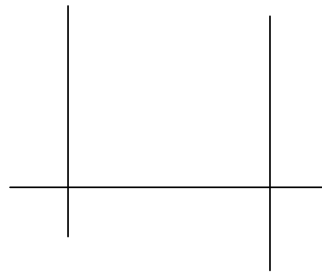
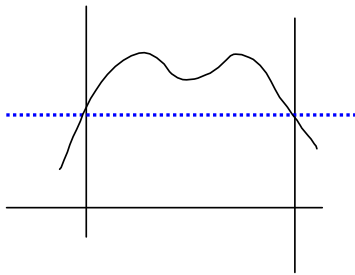


Today Is Test Day

Miscellaneous stuff... Questions?

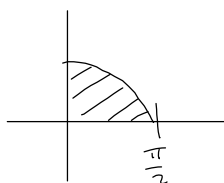
Rolls, MVT,



Here's a Maple Implementation. Remote section can't do this, due to access to technology issues. So here's the solution:

S4.1 #4

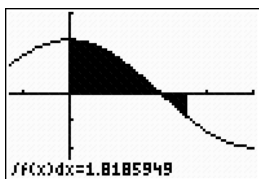
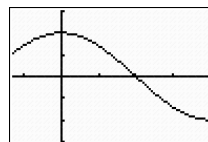
Area under $2 \cos(x)$ from $x=0$ to $x=\frac{\pi}{2}$:



TI-84 Implementation (EXACT VALUE)

```
Plot1 Plot2 Plot3
V1=cos(X)
V2=
V3=
V4=
V5=
V6=
V7=
```

```
WINDOW
Xmin=-1
Xmax=7
Xscl=pi/4
Ymin=-3
Ymax=3
Yscl=1
Xres=1
```



We're not set up (Remote) for you to do 10, 20, 30, ..., 100 = n Riemann Sums.

Here's Maple version 5

Right Endpoints

$$f(x) = 2 \cos(x)$$

$$[a, b] = [0, \frac{\pi}{2}]$$

We want:

$$\sum_{k=1}^n f(x_k) \Delta x = f(x_1) \Delta x + f(x_2) \Delta x + \dots + f(x_n) \Delta x$$

$$\Delta x = \frac{b-a}{n} = \frac{\frac{\pi}{2} - 0}{n} = \frac{\pi}{2n}$$

$$x_k = a + k \Delta x = \frac{k\pi}{2n}$$

$$\text{So } \sum_{k=1}^n f(x_k) \Delta x = \sum_{k=1}^n 2 \cos\left(\frac{k\pi}{2n}\right) \cdot \frac{\pi}{2n} = \frac{\pi}{n} \sum_{k=1}^n 2 \cos\left(\frac{k\pi}{2n}\right)$$

$$R := n \rightarrow \frac{\pi}{2 \cdot n} \cdot \sum_{k=1}^n 2 \cdot \cos\left(\frac{k \cdot \pi}{2 \cdot n}\right)$$

$$R := n \rightarrow \frac{\pi \left(\sum_{k=1}^n 2 \cos\left(\frac{k \pi}{2 n}\right) \right)}{2 n}$$

evalf(R(10))

1.838806341

evalf(R(30))

1.947183177

evalf(R(50))

1.968419577

evalf(R(100))

1.984250912

$\lim_{n \rightarrow \infty} R(n)$

2

S4.3: Fundamental Theorem of Calculus:

Find Antiderivative.

Evaluate .. at endpoints and subtract:

$$\int_a^b f(x) dx = F(b) - F(a), \text{ where } F'(x) = f(x)$$

$$\int_0^{\frac{\pi}{2}} 2 \cos(x) dx = 2 \int_0^{\frac{\pi}{2}} \cos(x) dx = 2 \sin(x) \Big|_0^{\frac{\pi}{2}} = 2 \sin\left(\frac{\pi}{2}\right) - 2 \sin(0)$$

$$= 2$$