

Homework 22

$$(e) f(t) = \frac{t^2-1}{\sqrt{t}} = \frac{t^2}{\sqrt{t}} - \frac{1}{\sqrt{t}} = \frac{t^2}{t^{\frac{1}{2}}} - \frac{1}{t^{\frac{1}{2}}} = t^{\frac{3}{2}} - t^{-\frac{1}{2}}$$

$$F(t) = \frac{2}{5}t^{\frac{5}{2}} - 2t^{\frac{1}{2}} + C$$

$$5) f(x) = x^2 \sqrt[3]{x} - 4 \cot(x) \csc(x) = x^{\frac{7}{3}} - 4 \cot(x) \csc(x)$$

$$F(x) = \frac{3}{10}x^{\frac{10}{3}} + 4 \csc(x) + C$$

$$10) f''(x) = -\cos(x) + \sin(x) \quad f(0) = 1 \quad f(\pi) = 0$$

$$f'(x) = -\sin(x) - \cos(x) + C_1$$

$$f(x) = \cos(x) - \sin(x) + C_1 x + C_2$$

$$1 = \cos(0) - \sin(0) + C_1 \cdot 0 + C_2$$

$$1 = 1 - 0 + 0 + C_2$$

$$1 = 1 + C_2$$

$$C_2 = 0$$

$$0 = \cos(\pi) - \sin(\pi) + C_1 \cdot \pi$$

$$0 = -1 - 0 + C_1 \pi$$

$$1 = C_1 \pi$$

$$C_1 = \frac{1}{\pi}$$

$$f(x) = \cos(x) - \sin(x) + \frac{1}{\pi} x$$

$$11) a(t) = 2t + 1 \quad s(0) = 3 \quad v(0) = -2$$

$$v(t) = \frac{2}{2}t^2 + t + C$$

$$v(t) = t^2 + t + C$$

$$-2 = 0 + 0 + C$$

$$C = -2$$

$$v(t) = t^2 + t - 2$$

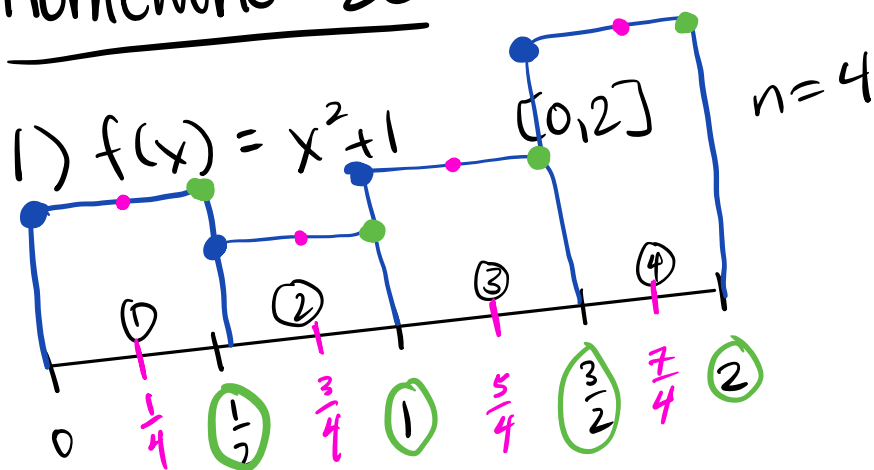
$$s(t) = \frac{1}{3}t^3 + \frac{1}{2}t^2 - 2t + C$$

$$3 = 0 + 0 + 0 + C$$

$$C = 3$$

$$s(t) = \frac{1}{3}t^3 + \frac{1}{2}t^2 - 2t + 3$$

Homework 23



left:

$$f(0) = 1$$

$$f\left(\frac{1}{2}\right) = \frac{5}{4}$$

$$f(1) = 2$$

$$f\left(\frac{3}{2}\right) = \frac{13}{4}$$

mid:

$$f\left(\frac{1}{4}\right) = \frac{17}{16}$$

$$f\left(\frac{3}{4}\right) = \frac{25}{16}$$

$$f\left(\frac{5}{4}\right) = \frac{41}{16}$$

$$f\left(\frac{7}{4}\right) = \frac{65}{16}$$

$$\frac{1}{2} \left[\frac{17}{16} + \frac{25}{16} + \frac{41}{16} + \frac{65}{16} \right] = \frac{148}{32} = \frac{37}{8}$$

$$\frac{1}{2} \left[1 + \frac{5}{4} + 2 + \frac{13}{4} \right]$$

$$= \frac{1}{2} \left[\frac{4+5+8+13}{4} \right] = \frac{30}{8} = \frac{15}{4}$$

right:

$$f\left(\frac{1}{2}\right) = \frac{5}{4}$$

$$f(1) = 2$$

$$f\left(\frac{3}{2}\right) = \frac{13}{4}$$

$$f(2) = 5$$

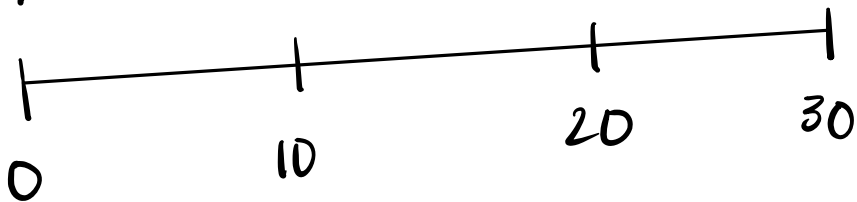
$$\frac{1}{2} \left[\frac{5}{4} + 2 + \frac{13}{4} + 5 \right] = \frac{1}{2} \left[\frac{5+8+13+20}{4} \right] = \frac{46}{8} = \frac{23}{4}$$

$$\sum_{i=1}^n f(x_i) \Delta x$$



3) $f(x) = x^2 + 2x$ $[0, 30]$ $n=3$

$$\Delta x = 10$$



left:	mid:	right:
$f(0)$	$f(5)$	$f(10)$
$f(10)$	$f(15)$	$f(20)$
$f(20)$	$f(25)$	$f(30)$