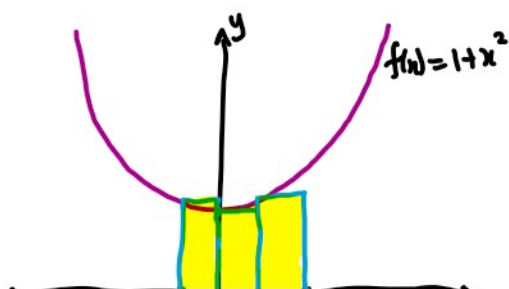


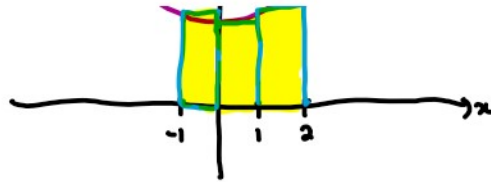
$$\begin{aligned}
 R_6 &= f(x_1)\Delta x + f(x_2)\Delta x + f(x_3)\Delta x + f(x_4)\Delta x + f(x_5)\Delta x + f(x_6)\Delta x \\
 &= [f(x_1) + f(x_2) + f(x_3) + f(x_4) + f(x_5) + f(x_6)] \Delta x \\
 &= [f(-0.5) + f(0) + f(0.5) + f(1) + f(1.5) + f(2)] 0.5 \\
 &= (1.25 + 1 + 1.25 + 2 + 3.25 + 5) 0.5 \\
 &= (13.75) 0.5 \\
 &= 6.875
 \end{aligned}$$

⑥ for  $n = 3$ ,  $\Delta x = \frac{2 - (-1)}{3} = 1$

So

$$x_1 = -1, x_2 = 0, x_3 = 1$$





Thus,

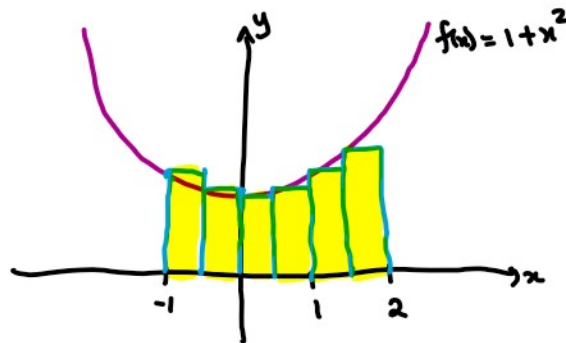
$$n = 3$$

$$\begin{aligned} L_3 &= f(x_1)\Delta x + f(x_2)\Delta x + f(x_3)\Delta x \\ &= [f(x_1) + f(x_2) + f(x_3)]\Delta x \\ &= [f(-1) + f(0) + f(1)] \cdot 1 \\ &= (2 + 1 + 2) \cdot 1 \\ &= 5 \end{aligned}$$

for  $n = 6$ ,  $\Delta x = \frac{2 - (-1)}{6} = 0.5$ .

So

$$x_1 = -1, x_2 = -0.5, x_3 = 0, x_4 = 0.5, x_5 = 1, x_6 = 1.5$$



$$n = 6$$

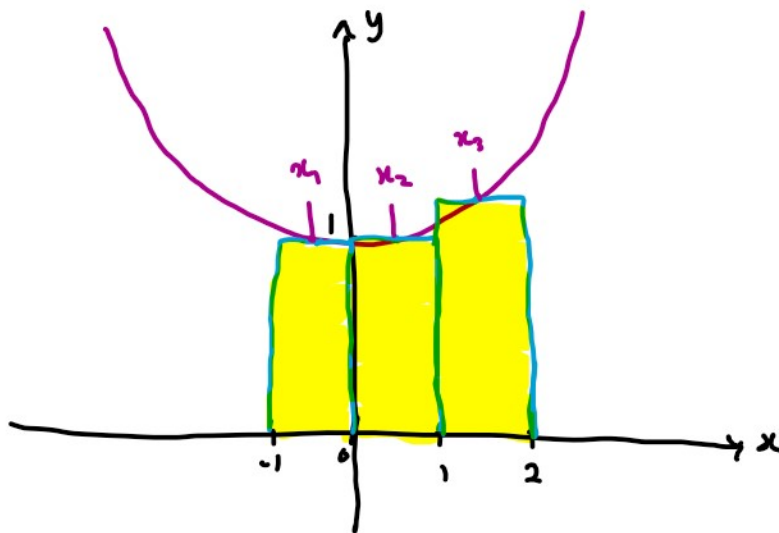
Thus,

$$\begin{aligned}
 L_6 &= [f(x_1) + f(x_2) + f(x_3) + f(x_4) + f(x_5) + f(x_6)] \Delta x \\
 &= [f(-1) + f(-0.5) + f(0) + f(0.5) + f(1) + f(1.5)] 0.5 \\
 &= (2 + 1.25 + 1 + 1.25 + 2 + 3.25) 0.5 \\
 &= (10.75) 0.5 \\
 &= 5.375
 \end{aligned}$$

② for  $n=3$ ,  $\Delta x = \frac{2 - (-1)}{3} = 1$

So

$$x_1 = -0.5, x_2 = 0.5, x_3 = 1.5$$



Thus,

$$M_3 = [f(x_1) + f(x_2) + f(x_3)] \Delta x$$

$$= [f(-0.5) + f(0.5) + f(1.5)] \cdot 1$$

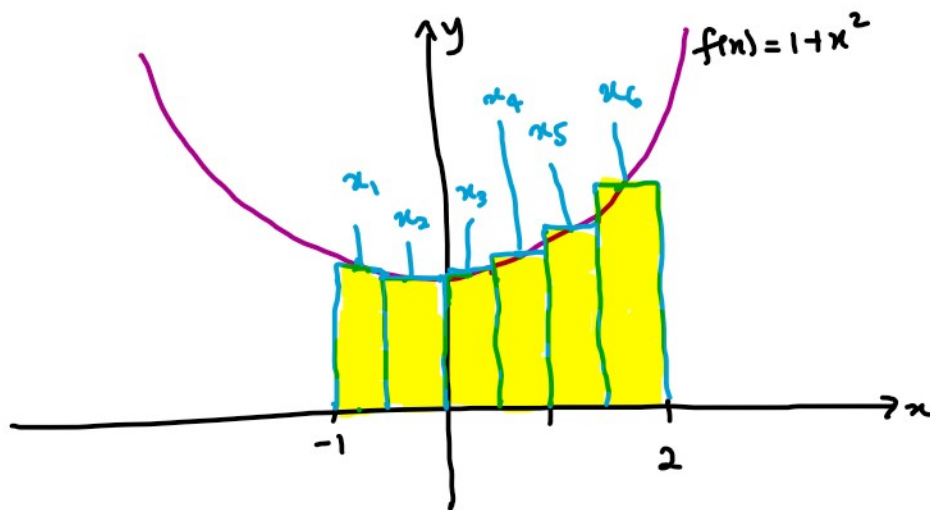
$$= (1.25 + 1.25 + 3.25)$$

$$= 5.75$$

for  $n = 6$ ,  $\Delta x = \frac{2 - (-1)}{6} = 0.5$

So

$$x_1 = -0.75, x_2 = -0.25, x_3 = 0.25, x_4 = 0.75, x_5 = 1.25, x_6 = 1.75$$



Thus,

$$M_6 = [f(x_1) + f(x_2) + f(x_3) + f(x_4) + f(x_5) + f(x_6)] \Delta x$$

$$= [f(-0.75) + f(-0.25) + f(0.25) + f(0.75) + f(1.25) + f(1.75)] \cdot 0.5$$

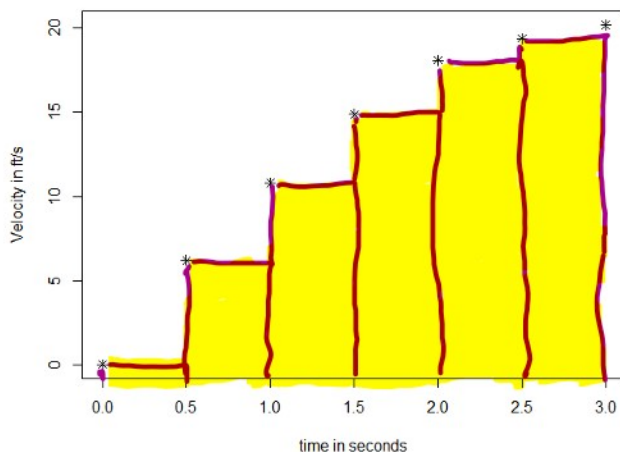
$$= (1.5625 + 1.0625 + 1.0625 + 1.5625 + 2.5625 + 4.0625) \cdot 0.5$$

$$= (11.875) \cdot 0.5$$

$$= 5.9375$$

(d) The best sketches from parts (a) – (c) are not very clear from rough hand sketches. Anyway, I opt in for sketches in (c).

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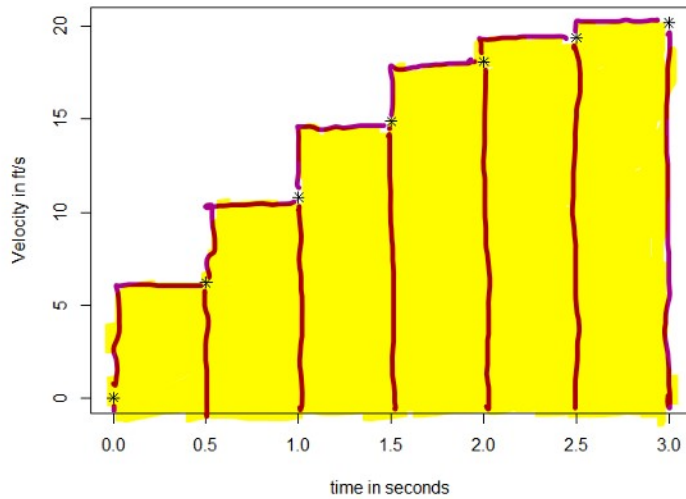


$$\Delta t = 0.5 \text{ and so } \frac{3-0}{n} = 0.5 \Rightarrow n = \frac{3}{0.5} = 6$$

Thus,

$$\begin{aligned} L_6 &= [f(0) + f(0.5) + f(1) + f(1.5) + f(2) + f(2.5)] \cdot 0.5 \\ &= (0 + 6.2 + 10.8 + 14.9 + 18.1 + 19.4) \cdot 0.5 \\ &= (69.4) \cdot 0.5 \\ &= 34.7 \text{ ft} \\ &= \underline{\underline{\quad}} \end{aligned}$$

Similarly, for upper estimate:



So

$$R_6 = [f(0.5) + f(1) + f(1.5) + f(2) + f(2.5) + f(3)] \cdot 0.5$$

$$= (6.2 + 10.8 + 14.9 + 18.1 + 19.4 + 20.2) \cdot 0.5$$

$$= (89.6) \cdot 0.5$$

$$= 44.8 \text{ ft} \cdot$$

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