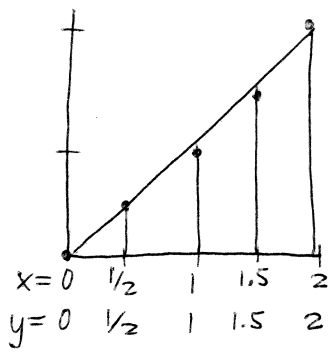
Section 6.5: 1-11 odd, 10

1. $\int_0^2 x\,dx$, $h = \frac{1}{2}$

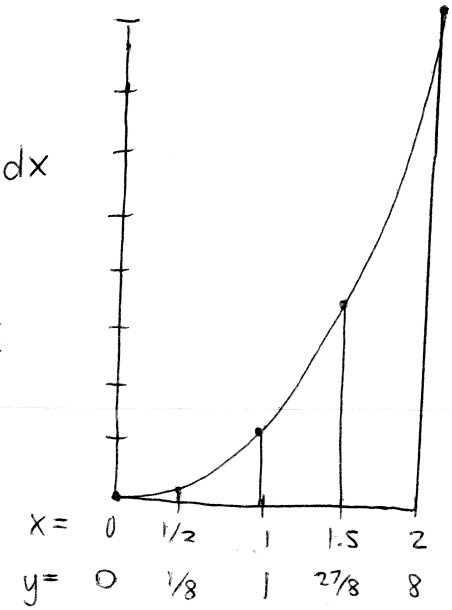


a) $T = \frac{1}{2}\cdot\frac{1}{2}(0+2(\frac{1}{2})+2(1)+2(1.5)+2) = \boxed{2}$

b) **Exact** bc no concavity for a line

c) $\int_0^2 x\,dx = \frac{1}{2}x^2\Big|_0^2 = \frac{1}{2}\cdot 2^2 - \frac{1}{2}\cdot 0^2 = 2-0 = \boxed{2}$

3. $\int_0^2 x^3\,dx$, $h = \frac{1}{2}$

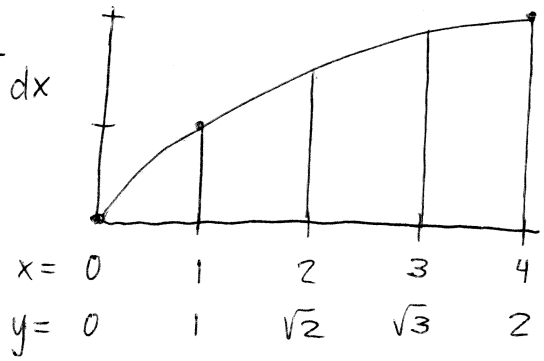


a) $T = \frac{1}{2}\cdot\frac{1}{2}(0+2\cdot\frac{1}{8}+2\cdot 1+2\cdot\frac{27}{8}+8) = \boxed{4.25}$

b) **Over** bc concave up

c) $\int_0^2 x^3\,dx = \frac{1}{4}x^4\Big|_0^2 = \frac{1}{4}\cdot 2^4 - \frac{1}{4}\cdot 0^4 = 4-0 = \boxed{4}$

5. $\int_0^4 \sqrt{x}\,dx$, $h = 1$



a) $T = \frac{1}{2}\cdot 1(0+2(1)+2\sqrt{2}+2\sqrt{3}+4) = \boxed{5.146}$

b) **Under** bc concave down

c) $\int_0^4 x^{1/2}\,dx = \frac{2}{3}x^{3/2}\Big|_0^4 = \frac{2}{3}\cdot 4^{3/2} = \frac{2}{3}\cdot 8 = \boxed{\frac{16}{3}}$

7. $T = \frac{1}{2}\cdot 1(12+2(10)+2(9)+2(11)+2(13)+2(16)+18) = \boxed{74}$

9. $V \approx 30T = 30\cdot\frac{1}{2}\cdot 5(6.0+2(8.2)+2(9.1)+2(9.9)+2(10.5)+2(11.0)+2(11.5)$
$+2(11.9)+2(12.3)+2(12.7)+13.0)$

$V \approx \boxed{15{,}990\ ft^3}$

10. a) $V \approx 20T = 20 \cdot \frac{1}{2} \cdot 200(0 + 2(520) + 2(800) + 2(1000) + 2(1140) + 2(1160) + 2(1110) + 2(860) + 0)$

$V \approx$ **26,360,000 ft³**

b) $\frac{26{,}360{,}000\ \text{ft}^3}{1} \cdot \frac{1\ \text{fish}}{1000\ \text{ft}^3} = 26{,}360$ fish to start the season

If 25% remain at the end of the season, then 75% can be caught.

$0.75(26{,}360) = 19{,}770$ fish can be caught

$\frac{19{,}770\ \text{fish}}{1} \cdot \frac{1\ \text{license}}{20\ \text{fish}} = 988.5$ licenses

Can't sell 0.5 license, so **988** licenses can be sold.

11.

		1.8	1.3	1.1	1.3	1.9	1.8	2.3	3.1	6.3	4.8	
Time	0	1.8	3.1	4.2	5.5	7.4	9.2	11.5	14.6	20.9	25.7	(s)
Speed	0	30	40	50	60	70	80	90	100	120	130	(mph)

$T = \frac{1}{2} \cdot 1.8(0+30) + \frac{1}{2} \cdot 1.3(30+40) + \frac{1}{2} \cdot 1.1(40+50) + \frac{1}{2} \cdot 1.3(50+60) + \frac{1}{2} \cdot 1.9(60+70)$

$+ \frac{1}{2} \cdot 1.8(70+80) + \frac{1}{2} \cdot 2.3(80+90) + \frac{1}{2} \cdot 3.1(90+100) + \frac{1}{2} \cdot 6.3(100+120) + \frac{1}{2} \cdot 4.8(120+130)$

$T = \frac{2{,}235\ \text{mi}}{\text{hr}} \cdot \frac{1\ \text{min}}{60\ \text{s}} \cdot \frac{1\ \text{hr}}{60\ \text{min}} =$ **0.621 mi or 3,278 ft**