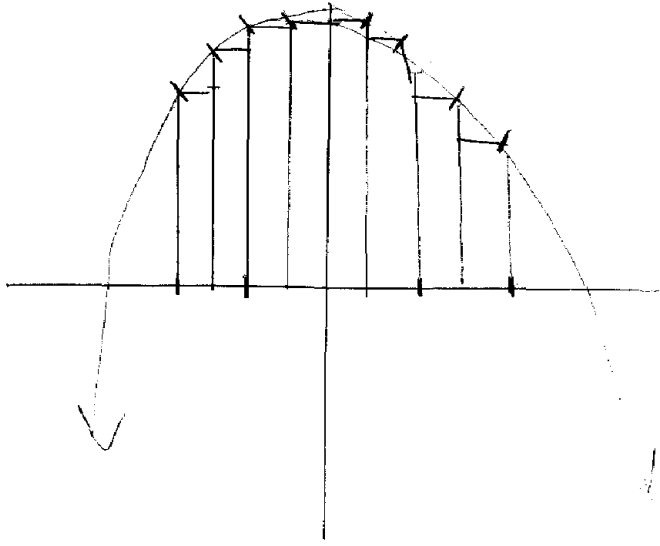


① $y = -x^2 + 9$ $[-2, 2]$ Inscribed



$$A_{R1} + A_{R2} + A_{R3} + \dots + A_{R8}$$

$$b(h_1) + b(h_2) + b(h_3) + \dots + b(h_8)$$

$$b(h_1 + h_2 + h_3 + h_4 + h_5 + h_6 + h_7 + h_8)$$

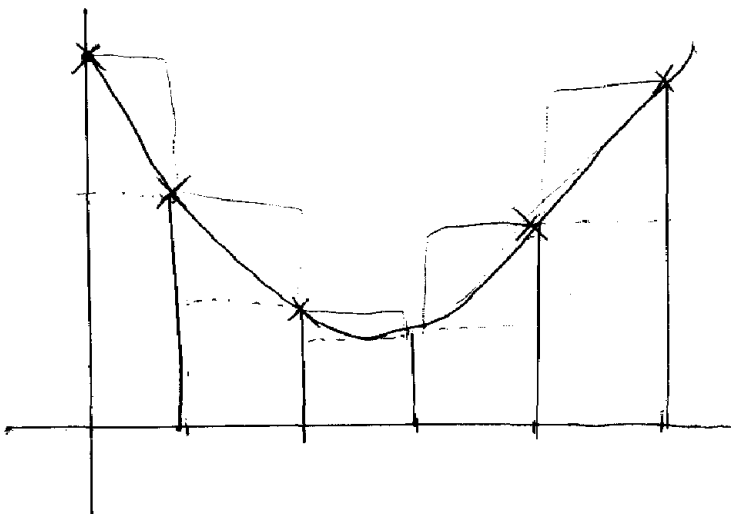
$$\frac{1}{2} (f(-2) + f(-1.5) + f(-1) + f(-0.5) + f(0.5) + f(1) + f(1.5) + f(2))$$

$$\frac{1}{2} (5 + 6.75 + 8 + 8.75 + 8.75 + 8 + 6.75 + 5)$$

$$\frac{1}{2} (57)$$

28.5

② $y = x^2 - 5x + 9$ $[0, 5]$ 5 sub intervals



Circumscribed

$$A_{R1} + A_{R2} + A_{R3} + A_{R4} + A_{R5}$$

$$b \cdot h_1 + b \cdot h_2 + b \cdot h_3 + b \cdot h_4 + b \cdot h_5$$

$$b(h_1 + h_2 + h_3 + h_4 + h_5)$$

$$1 (f(0) + f(1) + f(2) + f(4) + f(5))$$

$$1 (9 + 5 + 3 + 6 + 9)$$

$$1 (31) = \underline{31}$$

Inscribed

$$b(h_1 + h_2 + h_3 + h_4 + h_5)$$

$$b (f(1) + f(2) + f(3) + f(3) + f(4))$$

$$1 (5 + 3 + 3 + 3 + 5)$$

19

Temperature

Avg of Inscribed + Circumscribed

$$\frac{31 + 19}{2} = \underline{25}$$

$$\textcircled{3} \sum_{k=1}^{17} k^2$$

$$k^2 = \frac{n(n+1)(2n+1)}{6} = \frac{17(17+1)(2(17+1))}{6} = \frac{17(18)(35)}{6}$$

$\textcircled{1785}$

$$\textcircled{4} \sum_{k=1}^{25} 2k^2 + 3k$$

$$2 \left(\frac{n(n+1)(2n+1)}{6} \right) + 3 \left(\frac{n(n+1)}{2} \right)$$

$$2 \left(\frac{25(26)(51)}{6} \right) + 3 \left(\frac{25(26)}{2} \right)$$

$$2(5525) + 3(325) = \textcircled{12025}$$

$$\textcircled{5} \sum_{k=4}^9 7k^3 = 7 \left(k^3 = \left[\frac{n(n+1)}{2} \right]^2 \right)$$

$$7 \left(\left[\frac{9(10)}{2} \right]^2 - \left[\frac{3(4)}{2} \right]^2 \right)$$

$$7(45^2 - 6^2) = 7(2025 - 36) = \textcircled{13,923}$$

$$\textcircled{6} \sum_{k=6}^{109} 2k^2 - 5k$$

$$2 \left(\frac{109(110)(219)}{6} - \frac{5(6)(11)}{6} \right) - 5 \left(\frac{109(110)}{2} - \frac{5(6)}{2} \right)$$

$$2(437,635 - 55) - 5(5995 - 15)$$

$$2(437,580) - 5(5980)$$

$$875,160 - 29,900 = \textcircled{845,260}$$