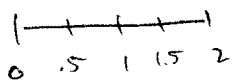


Math 122 HW #6

Section 7.6 1a, 6b, 10a, 10c, 23b

#1a $\int_0^2 3x^2 + 2 dx$, $n=4$, trap.

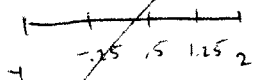


$$A \approx \frac{2-0}{4} \left(\frac{1}{2}(3 \cdot 0^2 + 2) + (3 \cdot 0.5^2 + 2) + (3 \cdot 1^2 + 2) + (3 \cdot 1.5^2 + 2) + \frac{1}{2}(3 \cdot 2^2 + 2) \right) = 12.25$$

#6b

~~$\int_{-1}^2 (2x^3 + 1) dx$~~

~~$n=4$, Simpson.~~



~~$\Delta x = .75$~~

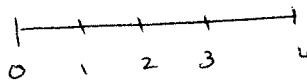
Sorry wrong problem

~~$A \approx \frac{2 - (-1)}{3 \cdot 4} \left(\frac{1}{3}(2(-1)^3 + 1) + 4(2(-0.25)^3 + 1) + 2(2(0.5)^3 + 1) + 4(2(1.25)^3 + 1) + 2(2 \cdot 2^3 + 1) \right)$~~

#10a

$\int_0^4 x\sqrt{2x^2+1} dx$

$n=4$, trap.



$$A \approx \frac{4-0}{4} \left(\frac{1}{2}(0\sqrt{2 \cdot 0^2 + 1}) + 1 \cdot \sqrt{2 \cdot 1^2 + 1} + 2\sqrt{2 \cdot 2^2 + 1} + 3\sqrt{2 \cdot 3^2 + 1} + \frac{1}{2} \cdot 4\sqrt{2 \cdot 4^2 + 1} \right)$$

$$= \frac{1}{2} 0 + \sqrt{3} + 2 \cdot \sqrt{9} + 3 \cdot \sqrt{19} + 2\sqrt{33}$$

$$= \sqrt{3} + 6 + 3\sqrt{19} + 2\sqrt{33} \approx 32.3$$

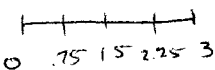
10c $\int_0^4 x \sqrt{2x^2+1} dx$ $u = 2x^2+1$
 $du = 4x dx$
 $\frac{1}{4} du = x dx$

$$= \int_{x=0}^{x=4} \sqrt{u} \cdot \frac{1}{4} du = \frac{1}{4} \int_{x=0}^{x=4} u^{1/2} du = \frac{1}{4} \left. \frac{2}{3} u^{3/2} \right|_{x=0}^{x=4}$$

$$= \frac{1}{6} (2x^2+1)^{3/2} \Big|_0^4 = \frac{1}{6} (2 \cdot 4^2+1)^{3/2} - \frac{1}{6} (2 \cdot 0^2+1)^{3/2} \approx 31.6$$

23b $y = e^{-t^2} + \frac{1}{t+1}$ from $t=1$ to $t=9$, $n=8$ 

Simp: $A \approx \frac{9-1}{3 \cdot 8} \left(e^{-1} + \frac{1}{1+1} + 4 \left(e^{-2^2} + \frac{1}{2+1} \right) + 2 \left(e^{-3^2} + \frac{1}{3+1} \right) + 4 \left(e^{-4^2} + \frac{1}{4+1} \right) + 2 \left(e^{-5^2} + \frac{1}{5+1} \right) \right.$
 $\left. + 4 \left(e^{-6^2} + \frac{1}{6+1} \right) + 2 \left(e^{-7^2} + \frac{1}{7+1} \right) + 4 \left(e^{-8^2} + \frac{1}{8+1} \right) + e^{-9^2} + \frac{1}{9+1} \right)$
 ≈ 1.76

6b $\int_0^3 (2x^3+1) dx$ $n=4$, Simp. 

$$A \approx \frac{3-0}{3 \cdot 4} \left(2 \cdot 0^3+1 + 4 \left(2 \cdot .75^3+1 \right) + 2 \left(2 \cdot 1.5^3+1 \right) + 4 \left(2 \cdot 2.25^3+1 \right) + 2 \cdot 3^3+1 \right) \approx 43.5$$