

Math 122 HW #4

Section 7.2 5, 7, 16

Section 7.3 13ad, 20

7.2 #5

$$\int \frac{2 \, dm}{(2m+1)^3}$$

$$u = 2m+1 \\ du = 2 \, dm$$

$$= \int \frac{du}{u^3} = \int u^{-3} du = -\frac{1}{2} u^{-2} + C = -\frac{1}{2} (2m+1)^{-2} + C$$

7.2 #7

$$\int \frac{2x+2}{(x^2+2x-4)^4} dx$$

$$u = x^2+2x-4 \\ du = (2x+2) dx$$

$$= \int \frac{1}{u^4} \cdot (2x+2) dx = \int u^{-4} du = -\frac{1}{3} u^{-3} + C = -\frac{1}{3} (x^2+2x-4)^{-3} + C$$

7.2 #16

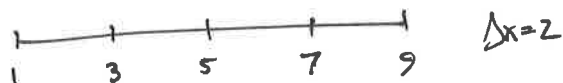
$$\int \frac{e^{\sqrt{y}}}{2\sqrt{y}}$$

$$u = \sqrt{y} = y^{1/2} \\ du = \frac{1}{2} y^{-1/2} dy = \frac{1}{2\sqrt{y}} dy$$

$$= \int e^u \cdot \frac{1}{2\sqrt{y}} dy = \int e^u du = e^u + C = e^{\sqrt{y}} + C$$

7.3 #13ad

$f(x) = \frac{2}{x}$ from $x=1$ to $x=9$ $n=4$



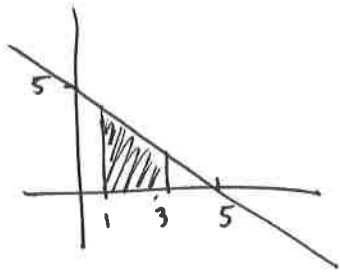
a left endpoints: $A \approx 2 \cdot f(1) + 2f(3) + 2f(5) + 2f(7)$
 $= 2 \cdot \frac{2}{1} + 2 \cdot \frac{2}{3} + 2 \cdot \frac{2}{5} + 2 \cdot \frac{2}{7} \approx 6.7$

d midpts:

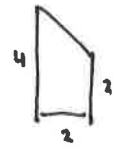
$$A \approx 2 \cdot f(2) + 2f(4) + 2f(6) + 2f(8)$$
$$= 2 \cdot \frac{2}{2} + 2 \cdot \frac{2}{4} + 2 \cdot \frac{2}{6} + 2 \cdot \frac{2}{8} \approx 4.2$$

7.3 #20

$\int_1^3 5-x \, dx$ geometrically:



it's a trapezoid



$A = \frac{1}{2} (4+2) \cdot 2 = 6.$