

# Math 122 HW # 3

7.2 # 7, 12, 32

7.3 # 6a, 13b

7.2 # 7

$$\int \frac{2x+2}{(x^2+2x-4)^4} dx \quad \begin{array}{l} u = x^2+2x-4 \\ du = 2x+2 dx \end{array}$$

$$= \int \frac{1}{u^4} \cdot 2x+2 dx = \int \frac{1}{u^4} du$$

$$= \int u^{-4} du = \frac{1}{-3} u^{-3} + C$$

$$= -\frac{1}{3} (x^2+2x-4)^{-3} + C$$

7.2 # 12

$$\int r e^{-r^2} dr \quad \begin{array}{l} u = -r^2 \\ du = -2r dr \\ -\frac{1}{2} du = r dr \end{array}$$

$$= \int e^u \cdot r dr = \int e^u \cdot \frac{1}{2} du = \frac{1}{2} \int e^u du$$

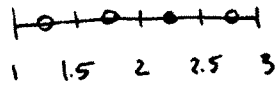
$$= \frac{1}{2} e^u + C = \frac{1}{2} e^{-r^2} + C$$

7.2 # 32

$$\int \frac{1}{x \ln x} dx \quad \begin{array}{l} u = \ln x \\ du = \frac{1}{x} dx \end{array}$$

$$= \int \frac{1}{u} \cdot \frac{1}{x} dx = \int \frac{1}{u} du = \ln u + C = \ln(\ln x) + C$$

7.3 #6b



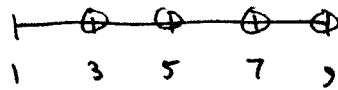
$$\Delta x = \frac{1}{2}$$

$$\text{Area} \approx \frac{1}{2} f(1.25) + \frac{1}{2} f(1.75) + \frac{1}{2} f(2.25) + \frac{1}{2} f(2.75)$$

$$= \frac{1}{2} (3 \cdot 1.25 + 2) + \frac{1}{2} (3 \cdot 1.75 + 2) + \frac{1}{2} (3 \cdot 2.25 + 2) + \frac{1}{2} (3 \cdot 2.75 + 2)$$

$$= 16$$

7.3 #13b



$$\Delta x = \frac{9-1}{4} = 2$$

$$A \approx 2 \cdot f(2) + 2 \cdot f(4) + 2 \cdot f(6) + 2 \cdot f(8)$$

$$= 2 \cdot \frac{2}{3} + 2 \cdot \frac{2}{5} + 2 \cdot \frac{2}{7} + 2 \cdot \frac{2}{9} = 3.15$$