

## Math 119 HW #12

Section 7.2 # 3, 16, 32,

7.3 # 5a, 8b

7.2 #3

$$\int 4(2x+3)^4 dx$$

$$u = 2x+3$$

$$du = 2 dx$$

$$\frac{1}{2} du = dx$$

$$= 4 \int u^4 dx$$

$$= 4 \int u^4 \cdot \frac{1}{2} du = 4 \cdot \frac{1}{2} \int u^4 du = 2 \int u^4 du = \frac{2}{5} u^5 + C$$

$$= \frac{2}{5} (2x+3)^5 + C$$

7.2 #16

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

$$u = \sqrt{y} = y^{1/2}$$

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

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

$$= e^u + C = e^{\sqrt{y}} + C$$

7.2 #32

$$\int \frac{1}{x \ln x} dx$$

$$u = \ln x$$

$$du = \frac{1}{x} dx$$

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

$$= \ln|\ln x| + C$$

7.3 # 5a Area of  $f(x) = 2x + 5$  from  $x = 2$  to  $4$ ,  $n = 4$ , left endpoints

$$A \approx .5 f(2) + .5 f(2.5) + .5 f(3) + .5 f(3.5)$$



$$= .5(2 \cdot 2 + 5) + .5(2 \cdot 2.5 + 5) + .5(2 \cdot 3 + 5) + .5(2 \cdot 3.5 + 5) \quad \Delta x = \frac{4-2}{4} = .5$$

$$= 21$$

7.3 # 8b Area under  $f(x) = x^2$  from 1 to 5,  $n = 4$ , right endpoints.



$$\Delta x = \frac{5-1}{4} = 1$$

$$A \approx 1 \cdot f(2) + 1 \cdot f(3) + 1 \cdot f(4) + 1 \cdot f(5)$$

$$= 2^2 + 3^2 + 4^2 + 5^2 = 54$$