

Math 122

HW #4

7.2 # 7, 16, 32

7.3 # 6a, 8d

7.2 #7

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

$$u = x^2 + 2x - 4$$

$$du = 2x + 2 \, dx$$

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

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

7.2 #16

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

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

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

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$$\int e^u \cdot \frac{1}{2} \frac{1}{\sqrt{y}} dy$$

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

7.2 #32

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

$$u = \ln x$$

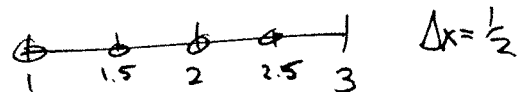
$$du = \frac{1}{x} dx$$

$$= \int \frac{1}{u} du = \ln u + C$$

$$= \underline{\ln(\ln x) + C}$$

7.3 #6a

$f(x) = 3x + 2$, from $x=1$ to $x=3$
 $n=4$, left midpts



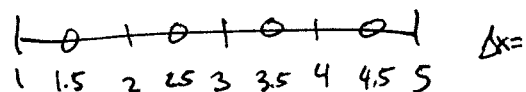
$$A \approx \frac{1}{2} f(1) + \frac{1}{2} f(1.5) + \frac{1}{2} f(2) + \frac{1}{2} f(2.5)$$

$$= \frac{1}{2}(3 \cdot 1 + 2) + \frac{1}{2}(3 \cdot 1.5 + 2) + \frac{1}{2}(3 \cdot 2 + 2) + \frac{1}{2}(3 \cdot 2.5 + 2)$$

$$= \frac{1}{2} \cdot 5 + \frac{1}{2} \cdot 6.5 + \frac{1}{2} \cdot 8 + \frac{1}{2} \cdot 7.5 = \frac{29}{2} = 14.5$$

7.3 #8a

$f(x) = x^2$, from $x=1$ to $x=5$
 $n=4$, midpts.



$$A \approx 1 \cdot f(1.5) + 1 \cdot f(2.5) + 1 \cdot f(3.5) + 1 \cdot f(4.5)$$

$$= 1.5^2 + 2.5^2 + 3.5^2 + 4.5^2 = \underline{41}$$