

Math 122 HW #5

Section 7.3 #25a

Section 7.4 #4, 11, 51

Section 7.5 #10

7.3 #25a left endpoints, $\Delta x = 5$

$$5 \cdot f(1980) + 5 \cdot f(1985) + \dots + 5 \cdot f(2000)$$

$$= 5 \cdot 702.7 + 5 \cdot 818 + 5 \cdot 902.9 + 5 \cdot 962.1 + 5 \cdot 1084.1 = 22349$$

7.4 #4

$$\int_{-2}^2 4z + 3 \, dz = 2z^2 + 3z \Big|_{-2}^2 = 2 \cdot 4 + 3 \cdot 2 - (2 \cdot 4 + 3 \cdot -2)$$

$$= 8 + 6 - (8 - 6) = 12$$

7.4 #11

$$\int_1^4 5\sqrt{y} + 3\sqrt{y} \, dy = \int_1^4 5y^{1/2} + 3y^{1/2} \, dy = \int_1^4 5y^{3/2} + 3y^{1/2} \, dy$$

$$= \frac{2}{5} 5y^{5/2} + \frac{2}{3} 3y^{3/2} \Big|_1^4$$

$$= 2y^{5/2} + 2y^{3/2} \Big|_1^4 = 2 \cdot 4^{5/2} + 2 \cdot 4^{3/2} - (2 + 2)$$

$$= 64 + 16 - 4 = 76$$

7.4 #51

$$\int_{-1}^4 f(x) dx = \int_{-1}^0 2x+3 dx + \int_0^4 \frac{-x}{4} - 3$$

$$= x^2 + 3x \Big|_{-1}^0 + \left. -\frac{1}{4} \cdot \frac{1}{2} x^2 - 3x \right|_0^4$$

$$= (0^2 + 3 \cdot 0) - ((-1)^2 + 3(-1)) + \left. -\frac{1}{8} x^2 - 3 \cdot 4 \right|_0^4 - \left(-\frac{1}{8} 0^2 - 3 \cdot 0 \right)$$

$$= -(-2) + -2 - 12 = -12$$

7.5 #10 Area between x^2, x^3

$$x^2 = x^3$$

$$x^3 - x^2 = 0$$

$$x^2(x-1) = 0$$

$$x=0 \text{ or } 1$$

who's bigger? plug $x=.5$

$$x^2: .5^2 = .25 \quad \text{bigger.}$$

$$x^3: .5^3 = .125$$

$$A = \int_0^1 x^2 - x^3 dx = \left. \frac{1}{3} x^3 - \frac{1}{4} x^4 \right|_0^1$$

$$= \frac{1}{3} - \frac{1}{4} - (0 - 0) = \frac{1}{3} - \frac{1}{4}$$