

MTH 131 FALL 2000 SECTIONS 2 and 3

QUIZ # 8

NAME:

KEY

1. Coal gas is produced at a gasworks. Pollutants in the gas are removed by scrubbers, which becomes less and less efficient as times goes on. The following measurement, made at the start of each month show the rate at which pollutants are escaping in the gas.

Time(months)	0	1	2	3	4	5	6
Rate (tons/month)	5	7	8	10	13	16	20

Make an overestimate and an underestimate of the total quantity of pollutants that escaped during the six months.

Underestimate

$$= 5(1-0) + 7(2-1) + 8(3-2) + 10(4-3) + 13(5-4) + 16(6-5)$$

$$= 5 + 7 + 8 + 10 + 13 + 16 = 59 \text{ tons}$$

Overestimate

$$= 7(1-0) + 8(2-1) + 10(3-2) + 13(4-3) + 16(5-4) + 20(6-5)$$

$$= 7 + 8 + 10 + 13 + 16 + 20 = 74$$

2. Using your calculator, evaluate $\int_1^3 (1.03)^x dx$

$$f_{nInt}((1.03)^x, x, 1, 3) \approx 2.122$$

3. The values of the function f is given in the following table.

x	10	14	18	22	26
$f(x)$	100	86	70	50	20

Estimate $\int_{10}^{26} f(x) dx$

Overestimate (left hand sum)

$$100 \times 4 + 86 \times 4 + 70 \times 4 + 50 \times 4 = 1224$$

Underestimate (right hand sum)

$$86 \times 4 + 70 \times 4 + 50 \times 4 + 20 \times 4 = 904$$

$$\int_0^{26} f(x) dx \approx \frac{1224 + 904}{2} = 1064$$