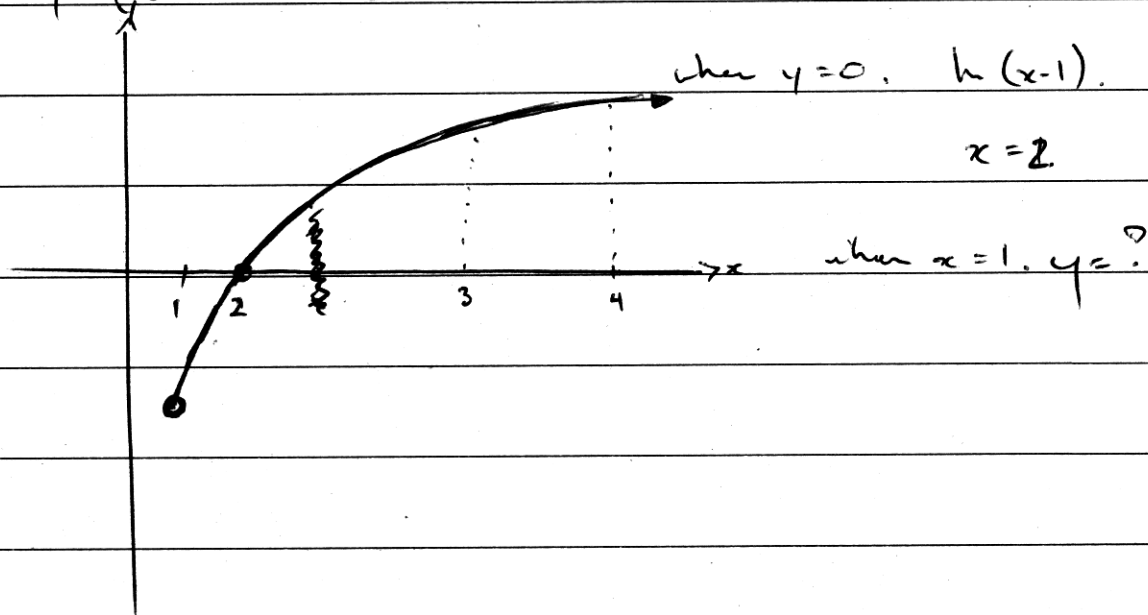




9 a.  $y = \ln(x-1) \quad x > 1.$

i.



ii.  $\int_2^4 \ln(x-1) dx.$

~~$$= \left[ \frac{1}{2}(x-1)^2 - \frac{1}{2}(x-1) \right]_2^4$$~~

$$\begin{aligned} h &= \frac{b-a}{n} \\ &= \frac{4-2}{2} \\ &= 1. \end{aligned}$$

x	2	3	4
f(x)	0	0.693	1.0986

$n = 2.$

$$\frac{h}{3} [f(x_1) + 4f(x_2) + f(x_3)]$$

$$= \frac{1}{3} [0 + 4(0.693) + 1.0986]$$

$$= \frac{1}{3} (1.376)$$

$$= \underline{\underline{0.459 \text{ units}}}$$

$$P = 5000 \quad r = \frac{8.75}{100} \quad n = 20.$$

$$b. \quad A_1 = 5000 (R).$$

$$A_2 = A_1 (R) + 5000 \left\{ 5000 (1.0875)^2 + 5000 \right\}.$$

$$A_3 = A_2 (R) = 5000 (1.0875)^3 + 5000 (1.0875) + 5000.$$

$$\sum_{20} A_{20} = A_{19} (R) \text{ ~~not needed~~ .}$$

$$= 5000 (1.0875)^{19} + 5000 (1.0875)^{18} \dots + \text{~~etc~~ .}$$

$$= 5000 (1.0875) \left( (1.0875)^{18} + (1.0875)^{17} + \dots + (1.0875)^0 \right)$$

~~Sum~~

$$A = 5000 (1.0875)$$

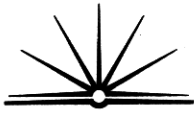
$$r = (1.0875),$$

$$\sum_n = \frac{a (r^n - 1)}{r^n - 1}.$$

$$n = 20.$$

$$\sum_{20} = \frac{5000 (1.0875) \left( (1.0875)^{20} - 1 \right)}{1.0875 - 1}$$

$$= \underline{\underline{\$ 270498.72.}}$$



$$c. \quad v_1 = \frac{t_2 - t_1}{v_2 - v_1} \quad t = 1.$$

$$= \frac{5 - 0}{50 - 0}$$

$$= \frac{5}{50}$$

$$= \frac{1}{10} t.$$

$$v_1 = \frac{t}{10}.$$

$$v_1 = 50.$$

$$\text{when } t = 5.$$

i.  $v_1 = 10t.$

(ii)

$$v_2 = 2t^2.$$

$$t = 5.$$

$$\text{Car } 50 \times 5 = 250 \text{ m.}$$

$$v_2 = 50 \text{ m.}$$

$$\text{jet} = 50 \text{ m.}$$

The jet and the car are.

The jet is 200 m behind the

car. after 5 sec.

(vi)

after  $t = 5$  sec the jet catches up and

overtakes the car.

$$200 \text{ m} = \frac{2t^3}{3} - 3\sqrt{375}.$$

$$250 = \frac{2t^3}{3} - 3\sqrt{375}.$$

$$t^2 = 7 \text{ sec}$$