

3) The quantity,  $Q$ , of radioactive carbon-14 remaining  $t$  years after an organism dies is given by the formula:

$$Q = Q_0 e^{-0.000121t} \quad \text{where } Q_0 \text{ is the initial quantity}$$

a) The skull of a former URI Calculus teacher is uncovered at an archeological dig. It is determined that the skull has lost 80% of the original amount of carbon-14 present. Estimate its age.

b) Calculate the half-life of carbon-14.

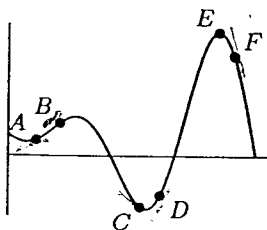
Table 2.4 gives values of a function  $P = f(t)$ .

- 4) (a) Does  $f'(5)$  appear to be positive or negative? What about  $f'(20)$ ?  
 (b) Estimate  $f'(10)$ .

TABLE 2.4

$t$	0	5	10	15	20	25
$P$	50	42	38	35	46	64

5) Match the points labeled on the curve shown with the given slopes.



SLOPE	POINT
2	
1	
$\frac{1}{2}$	
0	
-1	
3	