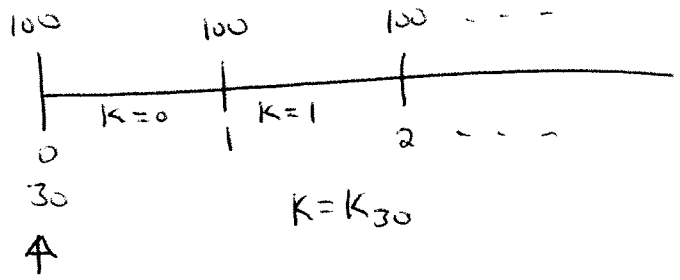
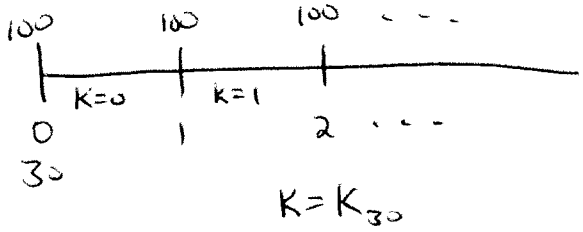
1) (See Video Solution)



$$PVRV = Y = 100\,\ddot{a}_{\overline{K+1}|.06}$$

$$P = Pr(Y \geq 800) = {}_{10}P_{30} \overset{ILT}{=\!=} .98019$$

2) (See Video Solution)

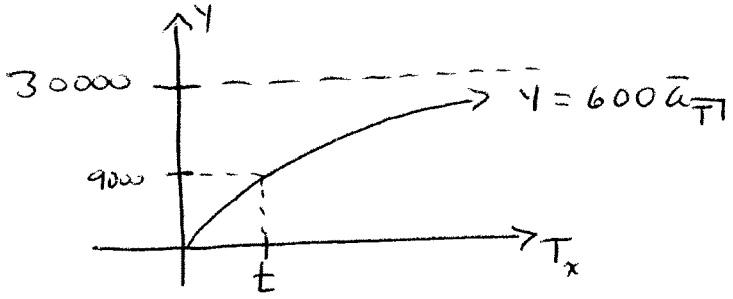


Σ = sum of payments

$$P = Pr(\Sigma \geq 800) = {}_7P_{30} \overset{\text{DML}(100)}{=\!=} \frac{63}{70} = .9$$

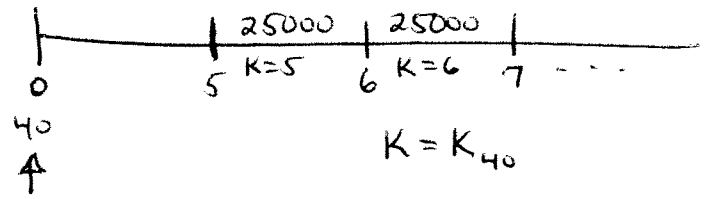
3) (See Video Solution)

$PVRV = Y = 600\,\bar{a}_{\overline{T}|}$



$$P = Pr(Y < 9000) = {}_t q_x = .51$$

4)



$PVRV = Z = 25000\ {}_{51}Z_{40}$

$P = Pr(Z < 10000)$

Draw Table

K	$Z = 25000\ {}_{51}Z_{40}$
< 5	0
5	$25000\, v^{6}_{.05} = 18655$
6	$25000\, v^{7}_{.05} = 17767$

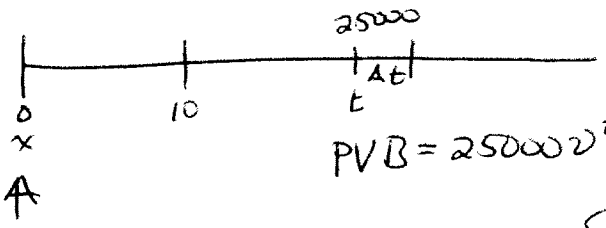
$25000\, v^{K+1}_{.05} = 10000 \Rightarrow K = 17+$

∴

K	Z	Pr
< 5	0	${}_5p_{40}$
6	> 10000	
7	> 10000	
⋮		
17	> 10000	
18	< 10000	$Pr = Pr(K \geq 18) = {}_{18}p_{40}$

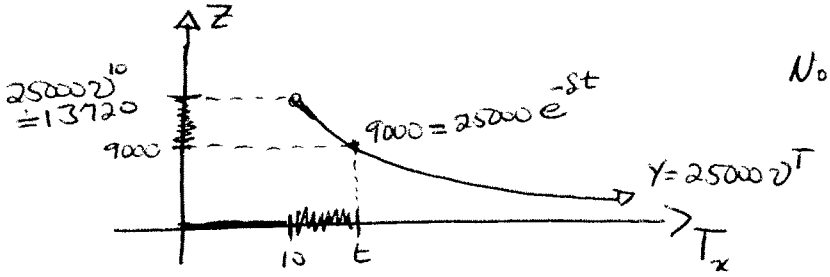
$\therefore P = Pr(Z < 10000) = {}_5p_{40} + {}_{18}p_{40} \overset{DML(80)}{=\!=} \frac{5}{40} + \frac{22}{40} = .675$

5)



$PVB = 25000 v^t$

$PVRV = Z = 25000 \cdot {}_{10|}\bar{Z}_x = \begin{cases} 0 & \text{if } T \le 10 \\ 25000 v^T & \text{if } T > 10 \end{cases}$



Note: $\delta = .06 \Rightarrow 25000 v^{10}$
$= 25000 e^{-10\delta} \doteq 13720$

$e^{-\delta t} = \frac{9000}{25000} = .36$

$Pr(Z > 9000) = Pr(10 < T_x < t)$

$= {}_{10}P_x - {}_tP_x$

$= e^{-10\mu} - e^{-t\mu}$

$= e^{-10\mu} - \left(e^{-\delta t}\right)^{\mu/\delta}$

$= e^{-10(.03)} - (.36)^{.03/.06}$

$= e^{-.3} - .6 = .14082$

6) (See Video Solution)

$$PVRV = Y = 100_{|10|}\overline{Y}_x = \begin{cases} 0 & \text{if } T \le 10 \\ 100(\bar{a}_{\overline{T}|} - \bar{a}_{\overline{10}|}) & \text{if } T > 10 \end{cases} \qquad T = T_x$$

$$Pr(Y > 750) = .31434$$

7) (See Video Solution)

$$PVRV = Y = 100 \cdot {}_{51}\ddot{Y}_{35} = \begin{cases} 0 & \text{if } K < 5 \\ 100(\ddot{a}_{\overline{K+1}|} - \ddot{a}_{\overline{5}|}) & \text{if } K \geq 5 \end{cases} \qquad K = K_{35}$$

$$Pr(Y < 900) = {}_{24}q_{35} = .11973$$