

(6)

(a)  $P(\text{1st survives and 2nd survives and 3rd survives})$

$$\Rightarrow P(\text{1st survives}) P(\text{2nd survives}) P(\text{3rd survives})$$

$$\Rightarrow (0.9986) (0.9986) (0.9986)$$

$$\Rightarrow (0.9986)^3 = 0.9958$$

$$(b) P(\text{20 24<sup>th</sup> year old males survive}) = (0.9986)^{20} \\ = 0.972$$

(7)  $P(\text{at least 1 dies})$

at least means "greater than  
or equal to"

$$\Rightarrow P(\text{1 dies or 2 dies or 3 dies or ... or 1000 dies})$$

$E^c$  = everyone survives

$$P(E^c) = (0.9986)^{1000} \\ = 0.2464$$

$$P(E) = 1 - P(E^c)$$

$$= 1 - 0.2464$$

$$= \boxed{0.7536}$$