more explanation about problem 2, part 2.6

part A) it is said that exactly one digit should be greater than 5. so it may be 6, 7, 8 & 9 $\Rightarrow$ 4 ways.

we can put this number in any of 3 positions $\Rightarrow$ 3 ways.

for example, we put it in _ X _ this digit.

for the other 2 digits, we can choose them among 0, 1, 2, 3, 4, 5 $\Rightarrow$ 6 ways.

So totally we have:

$$\underbrace{6}_{\text{number less then or equal to 5}} \times \underbrace{6}_{} \times \underbrace{4}_{\text{number greater than 5}} \times \underbrace{3}_{\text{permutation of the number greater than 5.}} = 432 .$$

$$P(E) = \frac{432}{1000}$$

part B) use the complement's property:

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

$$\underbrace{P(\text{at least one of the digit is larger than } 5)}_{A} = 1 - \underbrace{P(\text{all the digits are less than or equal } 5)}_{B}$$

we want to find A. for computing B, each digit can be chosen from 0, 1, 2, 3, 4, 5

$$B = \frac{6 \times 6 \times 6}{1000}$$

$$\Rightarrow A = 1 - \frac{6 \times 6 \times 6}{1000} = \frac{784}{1000}$$