A new car salesperson knows that she sells a car to one customer out of 20 who enter the showroom.
Find the probability that she'll sell a car to exactly two of the next three customers.
A. 0.9939
B. 0.0075
C. 0.0071
D. 0.1354
Solution.

1.Let A be the event of selling a car to a customer. Then ,according to the conditions $P(A)=1/20=0.05$ and $P(\bar{A})=1-P(A)=0.95$.

2.Let B be the event of selling a car to two customers out of the next three ones. Then

$$B=\bar{A}AA+A\bar{A}A+AA\bar{A}.$$

As the events $\bar{A}AA, A\bar{A}A, AA\bar{A}$ are incompatible then

$$P(B)=P(\bar{A}AA)+P(A\bar{A}A)+P(AA\bar{A})$$

and

$$P(B)=3P(\bar{A}AA)=3P(\bar{A})P(A)P(A)=3*0.95*0.05*0.05=0.007125.$$

Answer: 0.007125.