The sales per day in a shop is exponentially distributed with average sale amounting to Rs.100 and net profit is 8%. Find the probability that the net profit exceeds Rs.30 on two consecutive days.

Solution

We need to find the probability that the net profit exceeds Rs.30 on two consecutive days. Net profit is 8%. That's why the probability that the net profit exceeds Rs.30 is equal to the probability that sales exceeds

$$\frac{Rs.30}{0.08} = Rs.375.$$

But average sale on two consecutive days amounting to

$$2 \cdot Rs.100 = Rs.200.$$

The probability that the net profit exceeds Rs.30 on two consecutive days is

$$P(X > 375) = e^{-\frac{375}{200}} = 0.15.$$

Answer: 0.15.