Question 10.13.1.19

Two dice are thrown together. Find the probability that the product of the numbers on the top of the dice is less than 9

Solution:

Let the dice outcomes be x and y respectively

$P(X.Y < 9)$

$$P(X) = \frac{1}{6} \tag{1}$$

$$P(Y) = \frac{1}{6} \tag{2}$$

$$F(Z) = \sum_{j=1}^{6} x_i P(X.Y < 9 | x = j).P(x = j) \tag{3}$$

$$= \sum_{j=1}^{6} P(y < 9/j | X = j).P(X = j) \tag{4}$$

$$= \sum_{j=1}^{6} P(Y < 9/j).P(X = j) \tag{5}$$

$$= \frac{16}{36} \tag{6}$$

$$= \frac{4}{9} \tag{7}$$