Answer on Question #64827 – Math – Statistics and Probability

Question

Assuming that it is true that 2 in 10 industrial accidents are due to fatigue, find the probability that exactly 2 of 8 industrial accidents will be due to fatigue.

Solution

It is given that 2 in 10 industrial accidents are due to fatigue. Hence the probability of 'success' is

$$p = \frac{2}{10} = 0.2.$$

Using the binomial distribution, the probability that exactly 2 of 8 industrial accidents will be due to fatigue is given by

$$P(X = 2) = \frac{8!}{2! \cdot (8-2)!} \cdot 0.2^2 \cdot (1-0.2)^{(8-2)} = \frac{8!}{2! \cdot 6!} \cdot 0.2^2 \cdot 0.8^6 =$$

$$= \frac{8 \cdot 7 \cdot 6!}{2 \cdot 6!} \cdot 0.04 \cdot 0.262144 = 28 \cdot 0.04 \cdot 0.262144 = 0.29360128 \approx 0.2936.$$

Answer: 0.2936.