

AI1110 ASSIGNMENT 3

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Mother,father and son line up at random for a family picture.

E:son on one end,

F:father in middle.

Compute $P(E/F)$.

Solution:

Given events,

E : son on one end

F : father in middle

We denote mother,father and son with M,F and S respectively.

We have,

$$\begin{aligned} \text{Total number of arrangements possible} &= 3! \\ &\quad (0.0.1) \\ &= 6 \\ &\quad (0.0.2) \end{aligned}$$

$P(E \cap F)$:

M—F—S
S—F—M

no.of favourable outcomes = 2

$$\therefore P(E \cap F) = \frac{2}{6} = \frac{1}{3}$$

$P(F)$:

Favourable outcomes are same as in $P(E \cap F)$

$$\therefore P(F) = \frac{1}{3}$$

$$P(E/F) = \frac{P(E \cap F)}{P(F)} \quad (0.0.3)$$

$$= \frac{(1/3)}{(1/3)} \quad (0.0.4)$$

$$= 1 \quad (0.0.5)$$