Assignment 1

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1) Mother, Father and Son line up at random for a family picture. Determine $\Pr(E \mid F)$ where
E: Son on one end, F: Father in middle
Solution: The total ways of arranging Father, Son, Mother in the family chart is 3! = 6. By using property of conditional probability we have,

$$\Pr(E \mid F) = \frac{\Pr(EF)}{\Pr(F)} \tag{0.0.1}$$

The probability that Father in middle is

$$\Pr(F) = \frac{2!}{3!} \tag{0.0.2}$$

$$= \frac{1}{3} \tag{0.0.3}$$

The probability that Father in middle and Son is on one end is

$$\Pr(EF) = \frac{2!}{3!} \tag{0.0.4}$$

$$= \frac{1}{3} \tag{0.0.5}$$

From the equation (0.0.1)

$$\Pr(E \mid F) = 1 \tag{0.0.6}$$