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Answer to the question NO 1

Sample Space,

$S = \{BBB, BBG, BGB, BGG, GBB, GBG, GGB, GGG\}$

last child is girl

$X = \{BBG, BGG, GBG, GGG\}$

first chid is boy

$Y = \{BBB, BBG, BGB, BGG\}$

$\therefore P(X) = \frac{4}{8} = \frac{1}{2}$

$\therefore P(Y) = \frac{4}{8} = \frac{1}{2}$

$\therefore P(XY) = P(X) \cdot P(Y)$

$= \frac{1}{2} \cdot \frac{1}{2}$

$= \frac{1}{4}$

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Answer to the question No 2

Here,

$$F = \{(1,1), (1,2), (1,3), (1,4), (1,5), (1,6)\}$$

Given that summation is 6

$$\therefore E = \{(1,5), (2,4), (3,3), (4,2), (5,1)\}$$

We know,

$$\therefore P(EF) = P(E) \cdot P(F)$$

$$\therefore EF = \{(1,5)\}$$

$$\therefore P(EF) = \frac{1}{36}$$

$$P(F) = \frac{6}{36} = \frac{1}{6}$$

$$P(E) = \frac{5}{36}$$

$$\therefore P(EF) \neq P(E) \cdot P(F)$$

~~Independent~~

$\therefore$ Dependent.