

2

a)

i)

Let

$\Omega := \{1, 2, 3, 4, 5, 6\}$ (rolling a die)

$A := \text{"die shows 1, 2 or 3"}$ (first three numbers)

$B := \text{"die shows 2, 4 or 6"}$ (even numbers)

$$\Pr[A] = \frac{3}{6} = \frac{1}{2}$$

$$\Pr[B] = \frac{3}{6} = \frac{1}{2}$$

$$\Pr[A \cap B] = \frac{1}{6}$$

$$\Pr[A|B] = \frac{\Pr[A \cap B]}{\Pr[B]} = \frac{1}{3}$$

And thus $\Pr[A] > \Pr[A|B]$.

□

ii)