Basic Probability

1) Sum of numbers even & one of die shows 6

Possibilities (1,2) - 2 ways
(6,4) - 2 ways
(6,6) → 1 way

Probability = 5/36

2) Sum of numbers being less than 7
sum can be

6 - (3,3), (4,2), (5,1) - 5 ways
5 - (3,2), (4,1) - 4 ways
4 - (3,1), (2,2) - 3 ways
3 - (2,1) - 2 ways
2 - (1,1) - 1 way

$$P = \frac{5+4+3+2+1}{36} = 15/36 = 5/12$$

3) Given that atleast 1 Head is observed find probability of atleast 2 Heads

atleast 1H → HTT - 3 ways
HHT - 3 ways
HHH - 1 way

at least 2H → 4 ways (from above)

$$P(2H/1H) = \frac{P(2H \cap 1H)}{P(1H)} = 4/7$$

4) Married couple. - 2 kids

G G
G B
B G
B B

P(1G) - atleast 1 girl = 3/4

P(2G) = atleast 2 girls or 2 girls = 1/4

$$P(2G \mid 1G) = \frac{1/4}{3/4} = 1/3$$