

$$1) P(\text{white queen on a1}) = \frac{1}{8}$$

* There is 1 queen and 8 pieces at all so $P(\text{queen}) = \frac{1}{8}$

* And we consider only white pieces so $P(\text{white}) = 1$

2) We can't get black queen among our black pieces so $P(\text{black queen}) = 0$

3) $P(\text{rook on a1})$

* There is 2 rooks and 8 pieces at all so $P(\text{rook}) = \frac{1}{4}$

$$4) P(\text{not white queen}) = 1 - P(\text{queen}) = 1 - \frac{1}{8} = \frac{7}{8}$$

* There is 1 queen and 8 pieces at all so $P(\text{queen}) = \frac{1}{8}$

* And we consider only white pieces so $P(\text{white}) = 1$

$$5) P(\text{not rook}) = 1 - P(\text{rook}) = 1 - \frac{1}{4} = \frac{3}{4}$$

* There is 2 rooks and 8 pieces at all so $P(\text{rook}) = \frac{1}{4}$