

# QUIZ 3 MATH 1550 Fall 2018

A card is selected at random from a standard deck of 52 playing cards. Find the probability of randomly selecting a red suit or a king.

Soln : Goal:  $P(\text{"red suit" OR "king"})$

By addition rule:

$$P(\text{"red suit" OR "king"}) = P(\text{"red suit"}) + P(\text{"king"}) - P(\text{"red suit" AND "king"})$$

By multiplication rule:

$$P(\text{"red suit" AND "king"}) = P(\text{"red suit"}) P(\text{"king" | "red suit"})$$

So, calculate

$$P(\text{"red suit"}) = \frac{26}{52} = \frac{1}{2}$$

$$P(\text{"king"}) = \frac{4}{52}$$

$$P(\text{"king" | "red suit"}) = \frac{2}{26}$$

← 2 kings appear among the hearts & diamonds

Therefore we can compute

$$\begin{aligned} P(\text{"red suit" OR "king"}) &= P(\text{"red suit"}) + P(\text{"king"}) - P(\text{"red suit"}) P(\text{"king" | "red suit"}) \\ &= \frac{26}{52} + \frac{4}{52} - \frac{26}{52} \cdot \frac{2}{26} \\ &= \frac{26}{52} + \frac{4}{52} - \frac{2}{52} = \frac{28}{52} = 0.5384 \end{aligned}$$