BE-PRECALC TUESDAY 2-2-10

① WHAT IS THE probability THAT A CARD drawn from A STANDARD deck IS EITHER A face card or red?

MUTUALLY INCLUSIVE ⇒ can be red AND A face card ⇒ 6 cards

$$P(\text{face card}) = \frac{12}{52} = \frac{3}{13}$$

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

$$P(\text{face card } \underline{\text{and}} \text{ red}) = \frac{6}{52}$$

$$\therefore P(\text{face card or red}) = \frac{12}{52} + \frac{26}{52} - \frac{6}{52} = \frac{32}{52}$$

$$= \boxed{\frac{8}{13}}$$

Pg. 863 # 4–9 ⇒ Homework review

④ $P(7, \text{sum of } 4)$

$P(7) = \frac{1}{6}$

$P(\text{sum of } 4) = \frac{3}{36} = \frac{1}{12}$

	1	2	3	4	...
1	2	3	(4)	5	
2	3	(4)	5	6	
3	(4)	5	6	7	
4	5	...			
⋮					

Independent

$\therefore P(7, \text{sum of } 4) = \frac{1}{6} \cdot \frac{1}{12} = \boxed{\frac{1}{72}}$

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⑤ $P(2 \text{ socks})$ ⇒ Dependent

$P(\text{1st sock}) = \frac{4}{10} = \frac{2}{5}$

$P(2^{\text{ND}} \text{ sock}) = \frac{3}{9} = \frac{1}{3}$

$\therefore P(2 \text{ socks}) = \frac{2}{5} \cdot \frac{1}{3} = \boxed{\frac{2}{15}}$

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⑥ $P(2 \text{ sports drink})$ ⇒ Dependent

$P(1^{\text{st}} \text{ sports drink}) = \frac{4}{6} = \frac{2}{3}$

$P(2^{\text{ND}} \text{ sports drink}) = \frac{3}{5}$

$\therefore P(2 \text{ sports drinks}) = \frac{2}{3} \cdot \frac{3}{5} = \frac{6}{15} = \boxed{\frac{2}{5}}$

⑦ $P(\text{penny or dime}) \Rightarrow$ **MUTUALLY EXCLUSIVE**

HAS TO BE ONE OR THE OTHER

$$P(\text{penny}) = \frac{4}{13}$$

$$P(\text{dime}) = \frac{6}{13}$$

$$\therefore P(\text{penny or dime}) = \frac{4}{13} + \frac{6}{13} = \boxed{\frac{10}{13}}$$

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⑧ $P(\text{boy or blond}) \Rightarrow$ **MUTUALLY INCLUSIVE**

CAN be boy and blond

$$P(\text{boy}) = \frac{15}{27} = \frac{5}{9}$$

$$P(\text{blond}) = \frac{11}{27}$$

$$P(\text{boy and blond}) = \frac{6}{27} = \frac{2}{9}$$

$$\therefore P(\text{boy or blond}) = \frac{15}{27} + \frac{11}{27} - \frac{6}{27} = \boxed{\frac{20}{27}}$$

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⑨ $P(K \text{ or } Q) \Rightarrow$ **MUTUALLY EXCLUSIVE**

MUST BE ONE or the other

$$P(K) = \frac{4}{52} = \frac{1}{13}$$

$$P(Q) = \frac{4}{52} = \frac{1}{13}$$

$$P(K \text{ or } Q) = \frac{1}{13} + \frac{1}{13} = \boxed{\frac{2}{13}}$$

Classwork / homework:

Pg. 864 # 16-22

Answers:

(16) dependent, $\frac{5}{18}$

(17) independent, $\frac{25}{81}$

(18) independent, $\frac{1}{36}$

(19) dependent, $\frac{2}{7}$

(20) dependent, $\frac{8}{195}$

(21) dependent, $\frac{19}{1,160,054}$

(22) dependent, $\frac{32}{819}$