Date: / / object:

1-

$S_{Coin} = \{H, T\}$, $S_{die} = \{1, 2, 3, 4, 5, 6\}$

$S = 2 \times 6 = 12$

$S = \{(H,1), (H,2), (H,3), (H,4), (H,5), (H,6), (T,1), (T,2), (T,3), (T,4), (T,5), (T,6)\}$

a- Toss of the Coin

$S_{Coin} = \{H, T\}$

b- the throw of the die.

$S_{die} = \{1, 2, 3, 4, 5, 6\}$

c-

A (the event of head tossed) $\{H\}$

$P(A) = \frac{N(A)}{N(S)} = \boxed{\frac{1}{2}}$

B (the event that an odd number is thrown). $\{1, 3, 5\}$

$P(B) = \frac{N(B)}{N(S)} = \frac{3}{6} = \boxed{\frac{1}{2}}$

$P(A \cap B)$ (head and odd number)

$P(A \cap B) = \frac{3}{12} = \boxed{\frac{1}{4}}$

$P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$= \frac{1}{2} + \frac{1}{2} - \frac{1}{4} = 1 - \frac{1}{4} = \boxed{\frac{3}{4}}$

Date: / / object:

2-

Since $P(S)=1$

(a) $P(S)=P(B)+P(R)+P(Y)+P(G)+P(O)+P(T)$ ← missing

$1 = 0.3 + 0.2 + 0.2 + 0.1 + 0.1 + P(T)$

$\boxed{P(T)=0.1}$

(b)

i. brown or red one.

$P(B \cup R) = P(B)+P(R)-P(B \cap R) =$ ← They are mutually exclusive Can't happen at the same time

$0.3+0.2 = \boxed{0.5}$ (a)

ii. You didn't get a yellow one.

B, R, G, O, T ← الي جيب Yellow

$\boxed{1-P(Y) = 1-0.2 = 0.8}$

iii. You don't get either an orange one or a tan one

$1-P(O \cap T) = 1-P(O)\cdot P(T)$

$= 1-0.1+0.1$

$1-0.2$

$\boxed{=0.8}$

iv. You get one that is brown or red or yellow or green or orange or tan

$P(B \cup R \cup Y \cup G \cup O \cup T)$

$= 0.3+0.2+0.2+0.1+0.1+0.1$

$= \boxed{1}$

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3. Q, R are independent variables

$P(Q)=0.4$, $P(Q \text{ and } R)=0.1$

$P(Q \cap R)=0.1$

$P(R)$?

since they are independent, indeed they will be not mutually exclusive

$$P(Q \cap R) = P(Q) \cdot P(R)$$

$$0.1 = 0.4 \cdot P(R)$$

$$R(R) = \frac{0.1}{0.4} = \boxed{\frac{1}{4}}$$

---

mutually-exclusive events → disjoint (غير تابعين)
(can't happen at the same time)

they will be dependent always

→ because the idea of being can't happen at the same time.
(they are affect eachother)

---

not mutually exclusive events → can be (dependent, independent)

dependent → drawing a card from a deck without replacement

independent → Tossing a coin and rolling a die.

Date: / / object:

4.

Since Pr(A) not zero , Pr(B) not zero.
(they are Indepent (because no one will affect the other).
and IF they Independent they Can't be mutually-exclusive, so they will be → (not mutually exclusize).

(I, M) → impossible.
IF they are ~~Independent (don't~~ Mutually exclsize (Can't happen at the same time) so they are affecting eachother, (dependent. يؤثر على بعض)

(NI, M) → Possible, Permissible.
Tossing a Coin

We Can't have both (H, T) at the same time (mutually exclusize).
and they are (NI) because they affect each other, by IF one happen the other can happen at the same ~~time~~

(I, NM) → Possible, Permissble.
rolling 2 dice.

The idea of having 1 at the first dice, and 2 at the second dice is Possible, so they are not mutually-exclusize (because they can happen at the same time.
and they are Indepent because IF We have 1 at the first dice won't affect the second dice.

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(NI, NH) → Possible, Permissible

(A) → Pick a Card Without replacement

(B) → " " " " "

→ They are not mutually exclusive because they can happen at the same time

→ and they are not Independent because if one happen will affect the other.

5.

i. P(musician is a female)

$$P(F) = \frac{N(F)}{N(S)} = \frac{72}{130} = \boxed{\frac{36}{65}}$$

ii. P(musician is a male AND had Private instruction)

$$= \frac{15}{130} = \boxed{\frac{3}{26}}$$

iii. P(musician is a female OR is self-taught)

U

$$P(F) = \frac{36}{65}$$

$$P(S) = \frac{31}{130}$$

$$P(F \cup S) = \frac{36}{65} + \frac{31}{130} - \frac{12}{130}$$

$$= \boxed{\frac{7}{10}}$$

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