

probability mult selections at least one

(2) at least one green marble

select two diff (w/o replacement)

$$p(\text{at least one G}) = 1 - p(\text{no G})$$

work

$$p(\text{none G}) = p\left(\begin{smallmatrix} 1^{\text{st}} \\ n \\ G \end{smallmatrix} \text{ and } \begin{smallmatrix} 2^{\text{nd}} \\ n \\ G \end{smallmatrix}\right)$$

$$= p\left(\begin{smallmatrix} 1^{\text{st}} \\ n \\ G \end{smallmatrix}\right) \cdot p\left(\begin{smallmatrix} 2^{\text{nd}} \\ n \\ G \end{smallmatrix}\right)$$

$$= \frac{24}{26} \cdot \frac{23}{25}$$

$$= 1 - \frac{24}{26} \cdot \frac{23}{25}$$

$$\approx 0.15076923$$

$$\approx \boxed{0.151}$$

15.1%

(4) at least one green marble

Same as (2) but, with replacement

$$p(\text{at least one G}) = 1 - p(\text{no G})$$

$$\begin{matrix} 4p \\ \frac{24}{26} \cdot \frac{24}{26} \end{matrix}$$

$$= 1 - \left(\frac{24}{26}\right)^2$$

$$\approx 0.147928994$$

$$\approx \underline{0.148}$$

$$14.8\%$$

(6) at least one face card.

select three different
(w/o replacement)

$P(\text{at least one face card})$

$$= 1 - P(\text{no face card})$$

$$P(\overset{4}{\text{1st nt}} \text{ and } \overset{3}{\text{2nd nt}} \text{ and } \overset{2}{\text{3rd nt}})$$

$$P(\overset{4}{\text{1st nt}}) \cdot P(\overset{3}{\text{2nd nt}}) \cdot P(\overset{2}{\text{3rd nt}})$$

$$\frac{40}{52} \cdot \frac{39}{51} \cdot \frac{38}{50}$$

$$= 1 - \frac{40}{52} \cdot \frac{39}{51} \cdot \frac{38}{50}$$

$$\approx 0.552941176$$

$$\approx \underline{0.553}$$

$$55.3\%$$

(8) at least one face card

with replacement

prob at least one face card)

$$= 1 - \overset{\text{work}}{p(\text{no face card})}$$

same as (6) but,
with replacement

$$\frac{40}{52} \cdot \frac{40}{52} \cdot \frac{40}{52}$$

$$= 1 - \frac{40}{52} \cdot \frac{40}{52} \cdot \frac{40}{52}$$

$$= 1 - \left(\frac{40}{52}\right)^3$$

$$\approx 0.544833864$$

$$\approx \boxed{0.545}$$

(10) at least one test +

prob at least one test +)

select two
w/o replacement

$$= 1 - \overset{\text{work}}{p(\text{none test +})}$$

$$P(\text{none test}+) = P(\overset{\text{1st}}{\text{not}} + \text{and} \overset{\text{2nd}}{\text{not}} \text{test}+)$$

$$= P(\overset{\text{1st}}{\text{not}} \text{test}+) \cdot P(\overset{\text{2nd}}{\text{not}} \text{test}+)$$

$$= P(\text{test}-) \cdot P(\text{test}-)$$

$$= \frac{380}{500} \cdot \frac{379}{499}$$

$$= 1 - \frac{380}{500} \cdot \frac{379}{499}$$

$$\approx 0.422765531$$

$$\approx \underline{0.423}$$

$$(42.3\%)$$

(2) at least one test +

$$P(\text{at least one test}+)$$

$$= 1 - P(\text{none test}+)$$

with Replacement, Same as (1)

$$P(\overset{\text{1st}}{\text{test}} \text{ and } \overset{\text{2nd}}{\text{test}} -)$$

$$P(\overset{\text{1st}}{\text{test}} -) \cdot P(\overset{\text{2nd}}{\text{test}} -)$$

$$\frac{380}{500} \cdot \frac{380}{500}$$

$$= 1 - \left(\frac{300}{500} \right)^2$$

$$\approx 0.4224$$

$$\approx \underline{\underline{0.422}}$$

(14) Eight Question T/F Quiz

at least one correct guess

$P(\text{at least one correct guess})$

$$= 1 - P(\text{no correct guess})$$

$P(\overset{\text{work}}{\overset{P}{\text{1st nc and 2nd nc and ... and Eighth nc}}})$

$$P(\overset{\text{1st}}{\text{nc}}) \cdot P(\overset{\text{2nd}}{\text{nc}}) \cdot \dots \cdot P(\overset{\text{Eighth}}{\text{nc}})$$

$$\frac{1}{2} \cdot \frac{1}{2} \cdot \dots \cdot \frac{1}{2}$$

$$\left(\frac{1}{2} \right)^8$$

$$= 1 - \left(\frac{1}{2} \right)^8$$

$$\approx 0.99609375$$

$$\approx \underline{\underline{0.996}}$$

(16) at least one test +

$$p(\text{at least one test} +)$$

$$= 1 - p(\text{none test} +)$$

^{work}
Select 5 differ (w/o Rep)

$$p(\text{1st test} \text{ and } \text{2nd test} \text{ and } \dots \text{ and } \text{fifth test})$$

$$p(\text{1st test}) \cdot p(\text{2nd test}) \cdot \dots \cdot p(\text{fifth test})$$

note: $p(\text{test} +) = 16\% = 0.16$

individual

$$\text{ie, } p(\text{test} -) = 1 - p(\text{test} +)$$

$$= 1 - 0.16$$

$$= 0.84$$

so,

$$0.84 \cdot 0.84 \cdot 0.84 \cdot 0.84 \cdot 0.84$$

$$0.84^5$$

$$= 1 - 0.84^5$$

$$\approx 0.581788057$$

$$\approx \underline{\underline{0.582}}$$