

Statistics

Lecture 17



Feb 19-8:47 AM

A box has 8 Red & 12 Blue balls.

Randomly choose one ball,

$$1) P(\text{Red}) = \frac{8}{20} = \frac{2}{5} = 0.4 \quad 2) P(\text{Blue}) = \frac{12}{20} = \frac{3}{5} = 0.6$$

$$3) P(\text{Red and Blue ball}) = \frac{0}{20} = 0$$

↳ Impossible event

$$P(E) = 0 \quad \longleftrightarrow \text{Impossible Event}$$

$$P(E) = 1 \quad \longleftrightarrow \text{Sure event}$$

$$0 < P(E) \leq 0.05 \quad \longleftrightarrow \text{Rare Event}$$

Sep 26-9:10 AM

A full deck of playing cards has 52 cards,
26 Red, 12 Face, 4 Aces.

Draw one card

$$1) P(\text{Face}) = \frac{12}{52} = \boxed{.231}$$

$$2) P(\text{Red Ace}) = \frac{2}{52} = \boxed{.038}$$

$$0 < .038 < .05$$

$$3) P(\text{Red or Black}) = \frac{52}{52} = 1$$

Acceptable form of Answers

1) Reduced fraction

2) Round to 3-decimal places

3) Scientific Notation

Sep 26-9:16 AM

I surveyed 200 people, here is the Summary

	Dem.	Re.P.	Ind.	Total
Females	45	25	20	90
Males	15	25	70	110
Total	60	50	90	200

If we take one person randomly, find

$$1) P(\text{Female}) = \frac{90}{200} = \frac{9}{20} = \boxed{.45} \quad 2) P(\text{Republican}) = \frac{50}{200} = \frac{1}{4} = \boxed{.25}$$

$$3) P(\text{Female and Republican}) = \frac{25}{200} = \frac{1}{8} = \boxed{.125}$$

25 ÷ 200 [Math] [1: ▸] [Enter] [MATH] [2: ▸] [Dec] [Enter]

$$4) P(\text{Female OR Republican})$$

$$= \frac{140}{200} = \boxed{.7}$$

Sep 26-9:23 AM

If we randomly select one person,
Find the prob. that he/she has a birthday

1) today $\frac{1}{365} = .003$

2) this week $\frac{1}{52} = .019$

3) this month
 $= \frac{1}{12} = .083$

Sep 26-9:34 AM

Some Prob. rules & Terminologies

1) $0 \leq P(E) \leq 1$

2) Sum of all prob. is always 1.

3) $P(E) = 1 \iff$ Sure event

$P(E) = 0 \iff$ Impossible event

$0 < P(E) \leq .05 \iff$ Rare event

4) $\bar{E} \rightarrow$ E-bar, Not E, E complement

$$P(E) + P(\bar{E}) = 1$$

$$P(\bar{E}) = 1 - P(E)$$

Complement Rule

Sep 26-9:37 AM

Suppose $P(E) = .08$

$$P(\bar{E}) = 1 - P(E) \\ = 1 - .08 = \boxed{.92}$$

Suppose $P(E) = \frac{3}{17}$, find $P(\bar{E})$ in fraction

$$P(\bar{E}) = 1 - P(E)$$

$$= 1 - \frac{3}{17} = \boxed{\frac{14}{17}}$$

$$1 - 3 \div 17 \quad \boxed{\text{Math}}$$

$$\boxed{1} \rightarrow \boxed{\text{Frac}} \quad \boxed{\text{Enter}}$$

Sep 26-9:43 AM

Consider the numbers

1, 2, 3, 4,, 36, 37, 38, 39, 40.

choose a number.

$$P(\text{Selection} < 5) = \frac{4}{40} = \boxed{\frac{1}{10}} \quad P(\text{Selection} \geq 36) = \frac{5}{40} \\ = \boxed{\frac{1}{8}}$$

$$P(\text{Selection} < 5 \text{ and } \text{Selection} \geq 36) = \frac{0}{40} = \boxed{0}$$

$$P(\text{Selection} < 5 \text{ OR } \text{Selection} \geq 36) = \boxed{\frac{9}{40}}$$

$$P(\text{Selection is even}) = \frac{20}{40} = \boxed{\frac{1}{2}} \quad \checkmark \boxed{\text{SG 10}}$$

Sep 26-9:47 AM