

Statistics
Spring 2023
Lecture 14



Feb 19-8:47 AM

Class QZ 2
 use the chart below

x	y
4	15
6	20
6	24
8	30
10	32
12	35

L1 } L2

STAT

CALC

8:

use $\text{Lin Reg}(a+bx)$ to find

$a = 6.892 \approx 7$ } Round to whole #
 $b = 2.492 \approx 2$ }

$r^2 = .916 \approx 92\%$ } Round to whole %

$r = .957$ } 3-decimals

$\bar{y} = 26$

Feb 28-8:02 AM

Intro. to Probabilities

SE 10

E → Event or outcome

P(E) → Prob. that E happens

$$P(E) = \frac{\text{Total \# of all desired outcomes}}{\text{Total \# of all outcomes}}$$

Final Ans:

1) Reduced fraction

2) Rounded to 3-decimal places3) Scientific Notation *as needed.*

ex: A box has 10 balls, 4 are red color.

$$P(\text{we randomly select a red ball}) = \frac{\text{Total Red balls}}{\text{Total Balls}}$$

$$= \frac{4}{10} = \frac{2}{5} = .4$$

Mar 1-7:19 AM

A deck of playing cards has 52 cards,

26 red, 12 face cards, and 4 aces.

If we randomly draw one card,

$$1) P(\text{Draw a red card}) = \frac{26}{52} = \frac{1}{2} = .5$$

$$2) P(\text{Draw a face card}) = \frac{12}{52} = \frac{3}{13} \approx .231$$

12 ÷ 52 MATH 1: ▸ Frac Enter

MATH

2: ▸ Dec

Enter

$$3) P(\text{Draw a ace})$$

$$= \frac{4}{52} = \frac{1}{13} = .077$$

Mar 1-7:26 AM

Select one number from 1 to 30.

1, 2, 3, 4, 5,, 27, 28, 29, 30

$$1) P(\text{Select } 4) = \frac{1}{30} = 0.033$$

$$2) P(\text{Select below } 4) = \frac{3}{30} = \frac{1}{10} = 0.1$$

$$3) P(\text{Select above } 4) = \frac{26}{30} = \frac{13}{15} = 0.867$$

$$4) P(\text{Select at most } 4) = \frac{4}{30} = \frac{2}{15} = 0.133$$

1, 2, 3, 4

$$5) P(\text{Select at least } 4) = \frac{27}{30} = \frac{9}{10} = 0.9$$

~~1, 2, 3~~, 4, 5, 6, 7, ..., 30

$$6) P(\text{Select below } 4 \text{ or above } 27) = \frac{6}{30} = \frac{1}{5}$$

1, 2, 3 28, 29, 30

$$7) P(\text{Select below } 4 \text{ and above } 27) = \frac{0}{30} = 0$$

Mar 1-7:33 AM

Some Prob. terms and conditions:

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

$$2) \text{Sum of all } P(E) = 1$$

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

$$4) P(E) = 0 \iff \text{Impossible Event}$$

$$5) 0 < P(E) \leq 0.05 \iff \text{Rare Event}$$

Mar 1-7:45 AM

Do You Smoke?

Survey Size = 100

	Yes	NO	Total
Male	37	15	52
Female	13	35	48
Total	50	50	100

If we randomly select one of these people,

$$1) P(\text{Male}) = \frac{52}{100} = \frac{13}{25}$$

$$2) P(\text{Smoker}) = \frac{50}{100} = 0.5$$

$$3) P(\text{male and Smoker}) = \frac{37}{100} = 0.37$$

$$4) P(\text{Male or Smoker}) = \frac{37+13+15}{100} = \frac{65}{100} = \frac{13}{20}$$

Mar 1-7:49 AM

If we randomly select one person,

$$1) P(\text{has a birthday on today}) = \frac{1 \text{ day}}{365 \text{ Total days}} = \frac{1}{365} = 0.003$$

Rare event
 $0 < P(E) \leq 0.05$

$$2) P(\text{has a birthweek this week}) = \frac{1 \text{ week}}{52 \text{ wks in one Year}} = \frac{1}{52} = 0.019$$

Rare event
 $0 < P(E) \leq 0.05$

$$3) P(\text{has a birthmonth this month}) = \frac{1 \text{ Month}}{12 \text{ months in a Year}} = \frac{1}{12} = 0.083$$

Mar 1-7:58 AM

$E \rightarrow$ Desired event

$\bar{E} \rightarrow$ Not E , E -Complement

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

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

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

$$P(\text{Rain}) = .15$$

$$P(\overline{\text{Rain}}) = 1 - P(\text{Rain}) = 1 - .15 = \boxed{.85}$$

Suppose $P(E) = \frac{3}{13}$

$$P(\bar{E}) = 1 - P(E) = 1 - \frac{3}{13} = \frac{10}{13}$$

$$1 \quad \boxed{-} \quad 3 \boxed{\div} 13 \quad \boxed{\text{MATH}} \quad \boxed{1: \rightarrow \text{frac}} \quad \boxed{\text{Enter}}$$

Mar 1-8:05 AM

Standard deck of playing cards has
52 cards, 26 red, 12 face cards, and
4 aces.

If we randomly select one card,

$$P(\overline{\text{Ace}}) = 1 - P(\text{Ace}) = 1 - \frac{4}{52} = \boxed{\frac{12}{13}}$$

$$P(\overline{\text{Face}}) = 1 - P(\text{Face}) = 1 - \frac{12}{52} = \boxed{\frac{10}{13}}$$

$$P(\overbrace{\text{Ace or Face}}^{\text{4} + \text{12}}) = \frac{16}{52} = \boxed{\frac{4}{13}}$$

Impossible event

$$P(\text{Ace and Face}) = \frac{0}{52} = \boxed{0}$$

6 Cards

$$P(\text{Red Face Card}) = \frac{6}{52} = \boxed{.115}$$

Mar 1-8:10 AM

A piggy bank has 12 dimes, 3 Quarters, and 25 nickels. Shake it to get one coin out.

$$1) P(\text{Dime}) = \frac{12}{40} = \frac{3}{10} = 0.3$$

$$2) P(\text{Dime or Quarter}) = \frac{15}{40} = 0.375$$

$$3) P(\text{Quarter and nickel}) = 0$$

Impossible event

$$4) P(\overline{\text{Quarter}}) = 1 - P(\text{Quarter})$$

$$= 1 - \frac{3}{40} = \frac{37}{40} = 0.925$$

92.5%

≈ 93%

SE 10

Mar 1-8:19 AM