

Practice quiz on Probability Concepts

PUNTOS TOTALES DE 9

1. If $x =$ "It is raining," what is $\sim (\sim x)$?

1 / 1 punto

- ☐ "It is not raining"
- ☐ "It is always raining"
- ☒ "It is raining"
- ☐ "It is never raining"

✓ **Correcto**

The second negation cancels out the first one.

Similarly $\sim (\sim (\sim x)) = \sim x$

2. If the statement "I am 25 years old" is assigned probability 0, what probability is assigned to the statement "I am not 25 years old"?

1 / 1 punto

- ☐ Unknown
- ☐ -1
- ☒ 1
- ☐ 0

✓ **Correcto**

It is always the case that $p(x) + p(\sim x) = 1$.

3. If I assign to the statement $x = \text{"it will rain today"}$ a probability of $p(x) = 0.35$, what probability must I assign to the statement "it will not rain today?"

1 / 1 punto

- ☐ .5
- ☒ .65
- ☐ 0
- ☐ .35

✓ Correcto

$$p(x) + p(\sim x) = 1$$

4. Is the following collection of statements a probability distribution?

1 / 1 punto

1. I own a Toyota pickup truck
2. I do not own a Toyota pickup truck
3. I own a non-Toyota pickup truck
4. I do not own a non-Toyota pickup truck

- ☒ No
- ☐ Yes

✓ Correcto

5. I don't know what it means to be "ingenuous." What probability would I assign to the statement, "I am ingenuous OR I am not ingenuous"?

- ☐ 0
☐ -1
☐ .5
☒ 1

✓ **Correcto**

It is always the case, regardless of the content of the statement x , that $p(x \text{ or } \sim x) = 1$

6. A friend of mine circumscribes a circle inside a square, so that the diameter of the circle and the edge of the square are the same length. He asks me to close my eyes and pick a point at random inside the square. He says the probability that my point will also be inside the circle is $\frac{\pi}{4}$

Is this correct?

- ☒ Yes
☐ No

✓ **Correcto**

Probabilities can be any real number between 0 and 1. They do not need to be rational numbers – a numerator that is a transcendental number like π is acceptable.

Note that

the correct probability does not depend on the length r of the circle's radius.

For a circle with any radius r to be circumscribed inside a square, the square must have sides each of length $2r$. The area of the circle is πr^2 and the area of the square is $(2r)^2 = 4r^2$. The

probability of landing in a circle of area πr^2 when it is known that one is

7. The probability of drawing a straight flush (including a Royal Flush) in a five-card poker hand is 0.0000153908

1 / 1 punto

What is the probability of **not** drawing a straight flush?

- ☐ .9996582672
- ☐ .9967253809
- ☐ .9999745688
- ☒ .9999846092

✓ **Correcto**

$$p(\sim x) = 1 - p(x)$$

8. What is the probability that a fair, six-sided die will come up with a prime number? (Recall that prime numbers are positive integers other than 1 that are divisible only by themselves and 1)

1 / 1 punto

- ☒ $\frac{1}{2}$
- ☐ $\frac{1}{3}$
- ☐ $\frac{1}{6}$
- ☐ $\frac{2}{3}$

✓ **Correcto**

The faces with 2, 3 and 5 satisfy the condition – which makes 3 relevant outcomes out of the “universe” of 6 outcomes = $\frac{3}{6} = \frac{1}{2}$

9. The joint probability p (the die will come up 5, the next card will be a heart) is equal to the joint probability:

1 / 1 punto

- ☒ p (the next card will be a heart, the die will come up 5)
- ☐ p (the next card will be a heart, the die will **not** come up 5)
- ☐ p (the next card will **not** come up 5, the next card will be a heart)
- ☐