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Practice quiz on Probability Concepts

PUNTOS TOTALES DE 9

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

1 / 1 puntos

- ○ "It is never raining"
- ◉ "It is raining"
- ○ "It is always raining"
- ○ "It is not 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 puntos

- ○ 0
- ◉ 1
- ○ -1
- ○ Unknown

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

3. If I assign to the statement x = "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 puntos

- ◉ $.65$
- ○ $.35$
- ○ 0
- ○ $.5$

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

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

1 / 1 puntos

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

- ◯ Yes
- ◉ No

Correcto

The statements are not *exclusive*:1 and 4 could both be true, 2 and 3 could both be true, 2 and 4 could both be true, and even (1) and (3) could both be true (if I owned more than one pickup truck).

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"?

1 / 1 puntos

- ◯ -1
- ◯ 0
- ◉ 1
- ◯ .5

Correcto

It is always the case, regardless of the content of the statement x, that $p(x$ 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 $\frac{\pi}{4}$

1 / 1 puntos

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 Pi 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 Pi*r^2 and the area of the square is (2r)^2 = 4*r^2 = The probability of landing in a circle of area Pi*r^2 when it is known that one is in the area of the square is equal to the ratio of the area of the circle to the area of the square in which it is circumscribed, or Pi*r^2/4*r^2, which equals Pi/4.

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

1 / 1 puntos

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

- (•) $.9999846092$
- ( ) $.9967253809$
- ( ) $.9996582672$
- ( ) $.9999745688$

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 puntos

- ( ) $\frac{1}{3}$
- (•) $\frac{1}{2}$
- ( ) $\frac{2}{3}$
- ( ) $\frac{1}{6}$

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 puntos

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

✓ **Correcto**

In joint probabilities, the order does not change the probability:
$p(A, B) = p(B, A)$