Practice quiz on Bayes Theorem and the Binomial **Theorem**

PUNTOS TOTALES DE 9

1. A jewelry store that serves just one customer at a time is concerned about the safety of its isolated customers.

1/1 punto

The store does some research and learns that:

- . 10% of the times that a jewelry store is robbed, a customer is in the store.
- A jewelry store has a customer on average 20% of each
- The probability that a jewelry store is being robbed (anywhere in the world) is 1 in 2 million.

What is the probability that a robbery will occur while a customer is in the store?

- 500000
- 2000000
- 4000000
- 5000000

✓ Correcto

What is known is:

A: "a customer is in the store," P(A)=0.2

B: "a robbery is occurring," $P(B) = \frac{1}{2.000,000}$

 $P(\text{a customer is in the store} \mid \text{a robbery occurs}) = P(A \mid B)$

2.	If I flip a fair coin, with heads
	and tails, ten times in a row, what is the probability that I will get exactly six heads?

0.021

0.187

0.2051

0.305

✓ Correcto

By Binomial Theorem, equals

$$\binom{10}{6} \Big(0.5^{10}\Big)$$

$$= \left(\frac{10!}{4! \times 6!}\right) \left(\frac{1}{1024}\right)$$

= 0.2051

3. If a coin is bent so that it has a 40% probability of coming up heads, what is the probability of getting exactly 6 heads in 10 throws? 1 / 1 punto

1/1 punto

0.0974

0.1045

0.1115

0.1219

✓ Correcto

$$\binom{10}{6} \times 0.4^6 \times 0.6^4 = 0.1115$$

4. A bent coin has 40% probability of coming up heads on each independent toss. If I toss the coin ten times, what is the probability that I get at least 8 heads?

0.0132

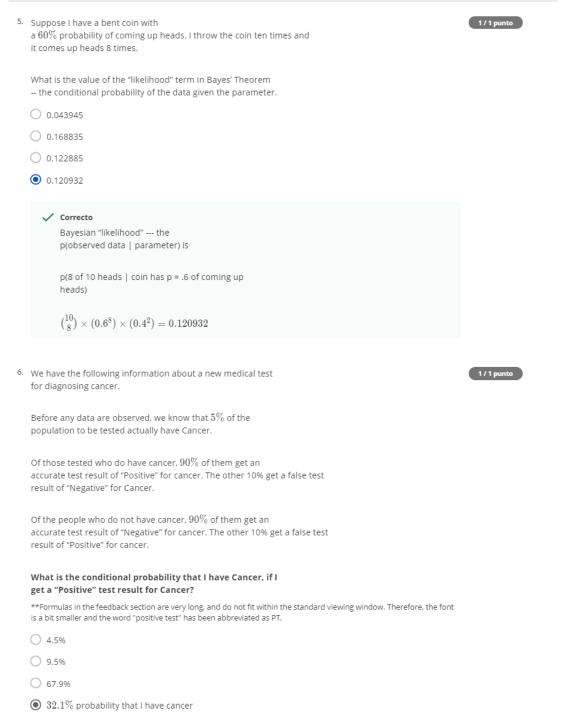
0.0312

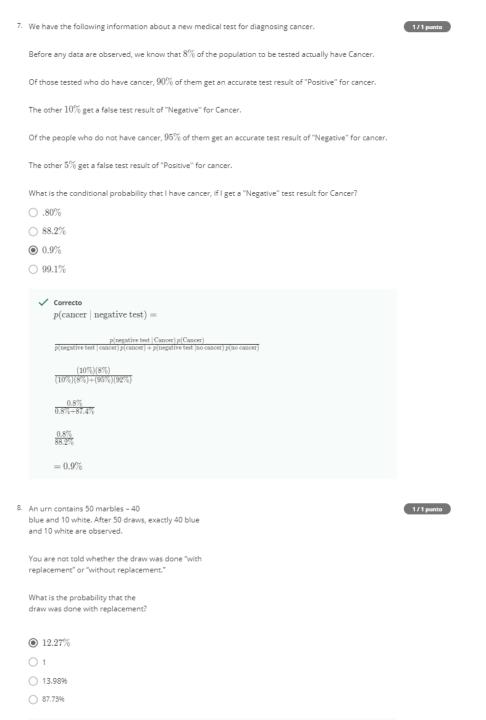
0.0213

0.0123

The answer is the sum of three binomial probabilities:

 $\binom{10}{9} \times (0.4^8) \times (.6^2) + \binom{10}{9} \times (0.4^9) \times (0.6^1) +$





9. According to Department of Customs Enforcement Research: 99% of people crossing into the United States are not smugglers.

1/1 punto

The majority of all Smugglers at the border (65%) appear nervous and sweaty.

Only 8% of innocent people at the border appear nervous and sweaty.

If someone at the border appears nervous and sweaty, what is the probability that they are a Smuggler?

- O 8.57%
- 7.58%
- O 7.92%
- O 92.42%

```
✓ Correcto
```

Ву

Bayes' Theorem, the answer is

$$\frac{(.65)(.01)}{((.65)(.01) + (.08)(.99))}$$

=7.58%