Statistics: Probability & Hypothesis Testing

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Name: _____ Date: _____ Score: / 8

DIRECTIONS *Answer each question. Show your work where applicable.*

1 Classify as discrete or continuous:

TemperatureinFahrenheit

Answer: _____

2 Which type of error?

Concludinginnocentwhenguilty

Answer: _____

3 Find the conditional probability:

$$\frac{P(A \cap B)}{P(B)} = \frac{0.6}{0.4}$$

Answer: _____

4 Contingency table is 2 \times 3. Degrees of freedom = (rows−1)(cols−1).

$$df = (3-1)(2-1)$$

Answer: _____

5 Classify as discrete or continuous:

Weightofanewbornbaby

Answer: _____

6 Which type of error?

Failingtorejectafalsenullhypothesis

Answer: _____

7 Two cards drawn without replacement. P(both Kings)?

$$P(K_1 \text{ and } K_2) = \frac{4}{52} \cdot \frac{3}{51}$$

Answer: _____

8 Find the conditional probability:

$$\frac{P(A \cap B)}{P(B)} = \frac{0.7}{0.3}$$

Answer: _____

Answer Key & Solutions

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TEACHER NOTES *Topics: discrete vs. continuous variables, Type I/II errors, conditional probability, chi-square degrees of freedom, and dependent events.*

1 Classify as discrete or continuous:

$$\text{TemperatureinFahrenheit}$$

$$= \text{Continuous}$$

"Temperature in Fahrenheit" is continuous because it takes on any value in a range

2 Which type of error?

$$\text{Concludinginnocentwhenguilty}$$

$$= \text{Typell Error}$$

Type II error: concluding innocent when guilty.

3 Find the conditional probability:

$$\frac{P(A \cap B)}{P(B)} = \frac{0.6}{0.4}$$

$$= 1.50$$

Divide the joint probability by the marginal.

4 Contingency table is 2 \times 3. Degrees of freedom = (rows−1)(cols−1).

$$df = (3-1)(2-1)$$

$$= 2$$

df = 2 × 1 = 2.

5 Classify as discrete or continuous:

$$\text{Weightofanewbornbaby}$$

$$= \text{Continuous}$$

"Weight of a newborn baby" is continuous because it takes on any value in a range

6 Which type of error?

$$\text{Failingtorejectafalsenullhypothesis}$$

$$= \text{Typell Error}$$

Type II error: failing to reject a false null hypothesis.

7 Two cards drawn without replacement. P(both Kings)?

$$P(K_1 \text{ and } K_2) = \frac{4}{52} \cdot \frac{3}{51}$$

$$= \frac{12}{52 \cdot 51} = \frac{12}{2652}$$

P(1st King) × P(2nd King | 1st King). Result ≈ 0.0045.

8 Find the conditional probability:

$$\frac{P(A \cap B)}{P(B)} = \frac{0.7}{0.3}$$

$$= 2.33$$

Divide the joint probability by the marginal.