

2. Our factory buys sheet metal from supplier A, and our long run experience has been that 90% of it meets our specifications. Supplier B claims to have a higher level of quality, so we test 30 of his shipments (that have been randomly sampled), and see that 29 of them meet our specifications. Is it safe to conclude that sheet metal from Supplier B is indeed of higher quality?
 - a. Formulate suitable quantitative hypotheses.
 - b. Calculate a p-value to address this question.
 - c. If the numerical answer to part b had been $p\text{-value} = 0.0051$, what would the yes-no conclusion be?
 - d. If the numerical answer to part b had been $p\text{-value} = 0.0051$, give a gray level interpretation of the result (in 4 words or less).
3. Are the following assignments of probabilities to outcomes legitimate? If not, why not?
 - a. Roll a die: $P[1] = P[2] = P[3] = P[4] = p[5] = p[6] = \frac{1}{4}$.
 - b. Draw a card: $P[\text{diamond}] = 12/52$, $P[\text{club}] = 13/52$, $P[\text{heart}] = 13/52$, $P[\text{spade}] = 14/52$.

4. When undergraduates write a 250 word essay (without spell checking.), the number X of errors has the following distribution:

Value of X	0	1	2	3	4
Probability	0.1	0.2	0.3	0.3	0.1

- a. Write the event of “at least two errors” in terms of X , and give its probability.
- b. Describe the event $\{X \leq 3\}$ in words, and give its probability.
- c. If it is known that there is an error, what is the chance of 4 errors?
- d. Find $P[X \leq 1 \text{ or } X > 3]$.
- e. Find $P\{X \leq 1 \text{ and } X > 3\}$.
- f. Find $P\{X \leq 1 \mid X > 3\}$.

