1. Spelling mistakes in a text are either “nonword errors” or “word errors.” A nonword error produces a string of letters that is not a word, such as “the” typed as “teh.” Word errors produce the wrong word, such as “loose” typed as “lose.” Nonword errors make up 25% of all errors. A human proofreader will catch 80% of nonword errors and 50% of word errors.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Word Error** | **Nonword Error** | **Total** |
| **Proofreader  will Catch** |  |  |  |
| **Proofreader  will NOT catch** |  |  |  |
| **Total** |  | 0.25 | 1 |

1. Compute the following and use your answers to complete the above table (two cells are given but the related questions may still appear below):
   1. What proportion of errors, caught or not caught, are nonword errors?
   2. What proportion of errors, caught or not caught, are word errors?
   3. What proportion of nonword errors will the proofreader catch?
   4. What proportion of nonword errors will the proofreader NOT catch?
   5. What proportion of word errors will the proofreader catch?
   6. What proportion of word errors will the proofreader NOT catch?
   7. What proportion of errors, word or nonword, will the proofreader NOT catch?
   8. What proportion of errors, word or nonword, will the proofreader catch?
2. If you select an error at random, that the proofreader caught, what is the probability that the selected error is a word error?
3. If you select a nonword error at random, what is the probability that the proofreader caught the error?

Draw a picture, label and shade it, and find the specified value.

1. P(Z > 0.89)
2. P(0.89 < Z < 2.34)
3. P(Z < k) = 0.9564
4. **Package Weights.** Suppose that the wrapper of a monster-size chocolate chip cookie lists its weight as 12 ounces. The actual weights of individual cookies naturally vary to some extent, however. Suppose that these actual weights vary according to a normal distribution with mean μ = 12.5 ounces and standard deviation σ = 0.224 ounces
5. What proportion of the cookies weigh less than the advertised 12 ounces?
6. What proportion of the cookies weigh more than 13 ounces?
7. What is the weight such that only 1 cookie in 800 weighs less than that amount?
8. If the manufacturer wants to adjust the production process so that only 1 cookie in 800 weighs less than the advertised weight, what should the mean of the actual weights be (assuming that the standard deviation of the weights remains 0.224 ounces)?
9. If the manufacturer wants to adjust the production process so that the mean remains at 12.5 ounces but only 1 cookie in 800 weighs less than the advertised weight, how small does the standard deviation of the weights need to be?