Homework assignment #7: Solutions

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Problem #1 (5 points)

Let $Z \sim N(0,1)$. Given that Z is at least 2, what is the probability that Z is less than 3?

Problem #2 (5 points)

Let $Z \sim N(0,1)$. Given that Z is at least 0.5, what is the probability that Z is at least 1?

Problem #3 (5 points)

Let $Z \sim N(0,1)$. Given that Z is at most 2, what is the probability that Z is at least 0.5?

Problem #4 (5 points)

Let $Z \sim N(0,1)$. Given that Z is at most 3, what is the probability that Z is at most 2.5?

Problem #5 (10 points)

The distribution of lengths of adult bass in Cumberland Lake is modeled as normal with mean 32" and standard deviation 6".

At the annual Cumberland Lake bass fishing competition, you win a blue ribbon if you catch a bass that is over 38" in length. If you catch a bass over 42" in length you also win a gold medallion.

Assume that an angler (the person fishing) is only allowed to catch the first fish s/he reels in.

Which of the following is the closest to the probability that an angler has not won a gold medallion **given** that s/he has won a blue ribbon?

Problem #6 (20 points)

Your diamond scale's measurement have a normally distributed error with mean 0 and standard deviation of 0.001 carats. Your procedure is to weigh a single diamond using your scale n times, average out the results, and report the average as the mass of the diamond. How many times n do you have to weigh your diamond so that your reported mass is at most 0.001 from the actual mass with probability 99%?