

# **Solving Normal-Distribution Probability Problems with and without Diagrams**

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**Abstract:** Two studies are reported that explore the usefulness of diagrams for solving normal distribution probability problems. Study 1 analyzed performance on normal probability problems from a midterm exam in a graduate level introductory statistics course. For each problem, we coded whether or not students used a diagram in their work, and whether the diagram was correct, and complete. We also coded correctness of the answer and "procedural correctness" - whether the answer used a correct solution strategy (even if computational errors resulted in the wrong answer). Use of a diagram was associated with procedural correctness of the solution. Study 2 gave normal probability problems to an online sample of participants screened to have had at least one statistics course. Participants provided with a diagram "hint" did better than participants given no hint. The results add to the body of research showing facilitative effects of diagrams in problem solving.