

UNIVERSITY OF TEXAS AT AUSTIN

Quiz 3The normal approximation to the binomial.

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Please, provide your complete solution to the following problems. There is no need to use the continuity correction.

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**Problem 3.1.** (5 points) According to the Pew research center, 64% of Americans say that social media have a mostly negative effect on things (see <https://pewrsr.ch/3dsV7uR>). You take a sample of 1000 randomly chosen Americans. What is the approximate probability that at least 650 of them say that social media have a mostly negative effect on things?

**Problem 3.2.** (5 points) According to a Gallup survey, only 22% of American young adults rate their mental health as *excellent*:

<https://www.gallup.com/education/328961/why-higher-education-lead-wellbeing-revolution.aspx>.

You sample 6000 randomly chosen American young adults. What is the approximate probability that at most 1400 of them rate their mental health as *excellent*?

**Problem 3.3.** (5 points) You toss a fair coin 10,000 times. What is the approximate probability that the number of *Heads* exceeds the number of *Tails* by between 200 and 500 (inclusive)?