

UNIVERSITY OF TEXAS AT AUSTIN

Quiz 6The normal approximation to the binomial.

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

Problem 6.1. (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 6.2. (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 6.3. (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)?