

## Warm-up:

Notation:  $z_\alpha$  is the positive  $z$  number corresponding to an area  $\alpha$ , i.e.  $p(0 < z < z_\alpha) = \alpha$

Examples: 1. Find  $z_{0.2517}$

2. Find  $z_{0.4927}$

3. Find  $z_{0.3750}$

## Polls and Margin of Error (Section 4.5)

-Polls give us a way to make predictions about the whole population based on results of a sample population

-Results are not absolutely certain since we only poll a small number of the population

-When news stations report results of a poll, they give us:

(1)

(2)

MOE represents the *largest* possible error associated with the sample estimate.

i.e. If poll predicts candidate A will receive 40% of vote with 5% MOE, really means candidate will likely receive between 35% and 45% of vote.

-Since MOE is only a prediction, we cannot guarantee it is correct, so we give a probability that we are correct, perhaps .95 or .97.

**-Margin of Error (MOE)** depends on 2 pieces of info: **sample size** and **confidence** in results. Also, MOE is based on the premise that survey results are normally distributed

**Confidence Level:** The probability that a prediction is correct

i.e. If we have a confidence level of 95% (standard in polls) and a MOE of 5%, means that we are 95% confident that the “true” percent lie within the region (+/- 5%) of the reported value

Math 107 Section 4.5

Examples

1. 500 EWU students were asked “are you in favor of a mandatory gym fee for all students?”  
370 said yes, and 130 said no.
  - a) What is the sample portion that said yes?
  - b) Find the MOE associated with a 90% confidence level.
  - c) If we want a MOE of 3%, what must our confidence level be?
  - d) Interpret your results from part b in the context of the problem.
2. For a 98% confidence level, find the MOE associated with a sample size of 300.
  - a) 300
  - b) If our sample size increased, would we expect the MOE to increase or decrease? Explain.
3. Find the MOE associated with a sample size of 1,000, given a confidence level of 90%.
  - a) 90%
  - b) If confidence level increased, would we expect the MOE to increase or decrease? Explain.