Sampling Distribution of $\hat{p}$
68-95-99.7 Rule
Sampling Distribution of $\hat{p}$, the sample proportion of orange Reeses Pieces

mean = $p = 0.45$

standard deviation = $\sqrt{\frac{p(1-p)}{n}} = \sqrt{\frac{0.45(0.55)}{25}} = 0.0995$

1. What is the chance that the sample (random sample of 25) proportion of orange Reeses Pieces is less than 0.30?

   • Draw a picture:

   ![Diagram showing the distribution of $\hat{p}$ and the region below 0.30]

   • Standardize: $z = \frac{0.30 - 0.45}{0.0995} = -1.51$
   
   • Use Table Z: $z = -1.51$ from the table the area under the standard normal curve is 0.0655. The chance that there will be less than 30% orange Reeses Pieces is 0.0655.

2. What is the chance that there will be more than 70% orange Reeses Pieces in a random sample of 25?

   • Draw a picture:

   ![Diagram showing the distribution of $\hat{p}$ and the region above 0.70]

   • Standardize:

   • Use Table Z: