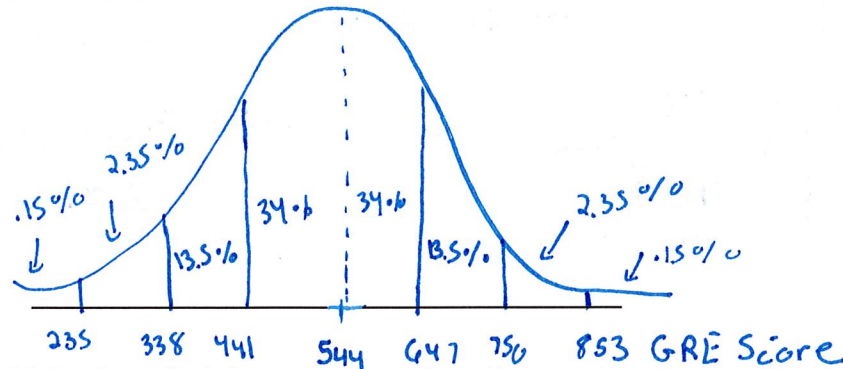


1. The Graduate Record Examinations are widely used to help predict the performance of applicants to graduate schools. The range of possible scores on a GRE is 200 to 900. The psychology department at a university finds that the scores of its applicants on the quantitative GRE are approximately Normal with mean = 544 and standard deviation = 103.

(a) Make an accurate sketch of the distribution of these applicants' GRE scores. Be sure to provide a scale on the horizontal axis.

$N(544, 103)$



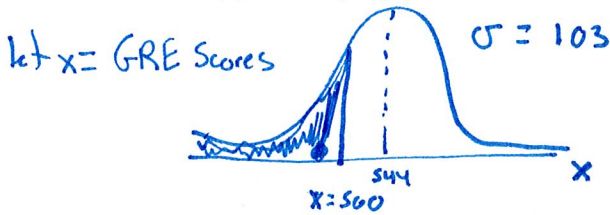
(b) Use the 68-95-99.7 rule to find the proportion of applicants whose score is between 338 and 853.

$$13.5\% + 68\% + 13.5\% + 2.35\%$$

or

$$95\% + 2.35\% = 97.35\% \text{ of the scores are between 338 and 853}$$

(c) What proportion of GRE scores are below 500?



$$N(544, 103)$$

$$\text{normalcdf}(-10,000, 500, 544, 103) = .3346$$

About 33.46% of scores are below 500.

(d) What proportion of GRE scores are above 800?

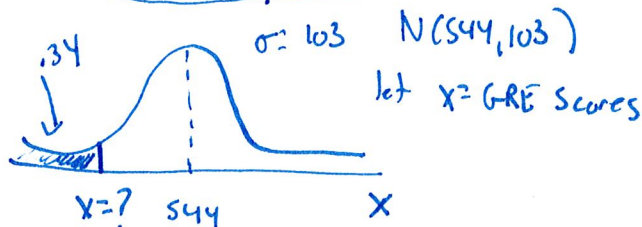


$$N(544, 103)$$

$$\text{normalcdf}(800, 10,000, 544, 103) = .0065$$

about .65% of scores are above 800

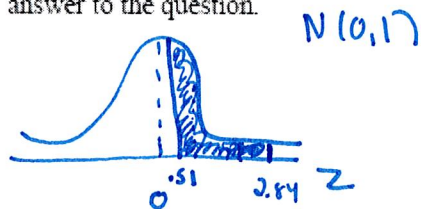
(e) Calculate and interpret the 34th percentile of the distribution of applicants' GRE scores.



$$\text{invNorm}(.34, 544, 103) = 501.5$$

34th percentile is score of ≈ 502 .
So about 34% of applicants have GRE scores below 502

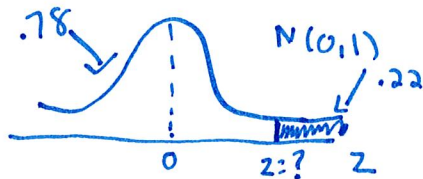
2. (a) Find the proportion of observations from a standard Normal distribution that satisfies $0.51 < Z < 2.84$. Sketch the Normal curve and shade the area under the curve that is the answer to the question.



$\text{normalcdf}(.51, 2.84, 0, 1) = \underline{\underline{.3028}}$
 about 30.28% of observations fall between 0.51 and 2.84

- (b) What z-score in a Normal distribution has 22% of all scores above it?

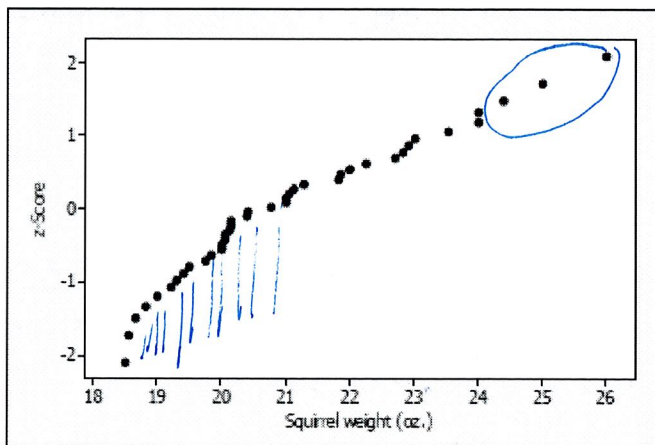
z score with 22% scores above is at the 78th percentile



$\text{invNorm}(.78, 0, 1) \approx .772$

$$Z \approx .772$$

3. A Normal probability plot for the weights of 40 squirrels trapped and released on a college campus is shown below. Is the distribution of squirrel weights approximately Normal? Justify your answer.



The normal probability plot is roughly linear, so the distribution of squirrel weights is approximately normal

some may argue that the points are not perfectly linear, but the overall trend is linear, suggesting a normal distribution.