Solutions to Practice for Quiz 1

Math 125 (Introductory Statistics) *Kovitz* Spring 2025

1. The number of men between 66 and 70 inches is 970 out of 2000, so the precentage of men in that interval is 48.5%.

   Under the normal curve, that percentage is between $z = -0.65$ and $z = 0.65$.

   The standard units for 70 inches will be about 0.65.
   Use the formula $z = \frac{\text{observation}-\text{average}}{\text{SD}}$.

   Fill in: 0.65 = (70-68)/SD.

   Solve algebraically for SD:

   Multiply both sides by SD to get: 0.65 times SD = 2.

   Divide both sides by 0.65 to get: SD = 2 / 0.65 = 3.077.

   For the area between 64 and 72 inches, find the standard units of the endpoints.

   $z = (64 - 68)/3.077 = -1.30$ and $z = (72 - 68)/30.77 = 1.30$.

   The percentage of men between 64 inches and 72 inches will be the area under the normal curve between -1.30 and 1.30. That is 80.64%.

   The number of men will be .8064 times the total number of men: $0.8064 \times 2000 = 1613$.
   That's about 1610: Answer (D)

2. Answer: (E) 750

   The range 280–720 correspeonds to ± 2.2 in standard units. About 97.22% of the students at the university had scores in this range. There must have been about $1000/.9722 \approx 1030$ students at the university. The range 390–610 corresponds to ± 1.1 in standard units. About 72.87% of the students at the university had scores in this range: 72.87% of $1030 = 0.7287 \times 1030 \approx 750$.

   Moral: the normal curve is not a rectangle.

3. First convert the score to standard units: $(345 - 550)/100 = -205/100 = -2.05$

   Then note that the area below -2.05 on the normal curve will be the precentile rank.

   First look up 2.05 to see that the area in the middle is 96%.

   We want the area of the left-hand tail. Take 96% from 100% to get 4%, then divide the 4% by 2:

   Answer: (A) the 2nd