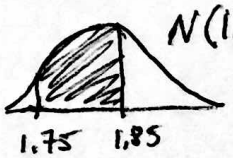
Section 2-2 Review Worksheet

For each question, be sure to draw the appropriate pictures and show the appropriate formulas. Show your work as if this was a quiz or a test.

Mr. Wilcox spends a full day at Gingerman Raceway testing some new tires on his Honda Civic. For 400 laps, he records his laptime in minutes. At the end of the day, he plots the distribution of times and realizes that it follows an approximately normal distribution with a mean of 1.84 and a standard deviation of .07.

1. Mr. Wilcox would really like his laptimes to be consistently between 1.75 and 1.85 minutes. What proportion of his laps were in this range? Interpret your result in the context of the problem.



Find z-scores for each value to standardize dist.

$z = \frac{1.75 - 1.84}{.07} = -1.29$

$z = \frac{1.85 - 1.84}{.07} = .14$

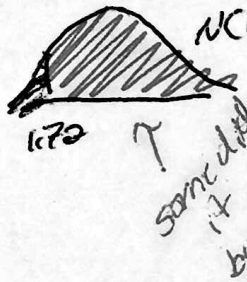
Find both areas to left, then subt. to get middle

Area = .5557 − .0985

Calc: .4575

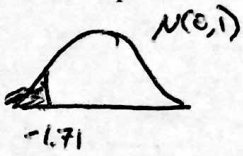
= .4571 or 45.71% of his laptimes are consistently b/n 1.75 + 1.85 minutes

2. In order to beat ItaTom, Mr. Wilcox needs to have lap times that are less than 1.72 minutes. Find the proportion of laps that were faster than 1.72 minutes. Interpret your result in the context of the problem.



Find z-score to standardize:

$z = \frac{1.72 - 1.84}{.07} = -1.71$

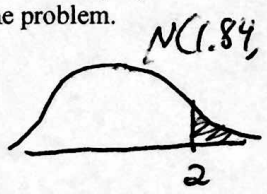


Use table to find area to left.

$P(z < -1.71) = .0436$

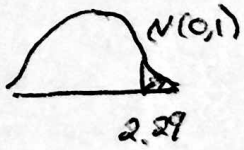
Only 4.36% of laps were faster than 1.72 mins.

3. In what proportion of laptimes did it take Mr. Wilcox more than 2 minutes? Interpret your result in the context of the problem.



Find z-score to standardize:

$z = \frac{2 - 1.84}{.07} = 2.286$



use table for area to left of z = 2.29, then do 1 − ans.

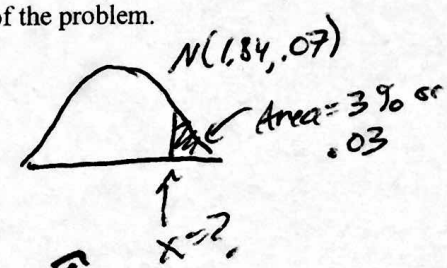
$P(z > 2.29) = 1 - P(z < 2.29)$

$= 1 - .98899$

$= .011.$

Only 1.1% of wilcox laptimes are more than 2 min

4. What laptime is necessary for Mr. Wilcox to be in the fastest 3% of all his laps? Interpret your result in the context of the problem.



Find z-score to standardize.

z corresponds to 97th percentile.

use table:

$z = 1.88$

Now work back to find exact laptime for fastest 3% w/ formula:

$1.88 = \frac{x - 1.84}{.07}$

$x = 1.972$

1.972 min is minimum value to be in fastest 3%.

or: 1.972 min or less?? Hmm.

This is backwards! Ugh!

$z = -1.88$

$-1.88 = \frac{x - 1.84}{.07}$

$x = 1.708$ min