

30 points

Name: KEY

Quiz 6

Stat 243

Fall 2009

November 24

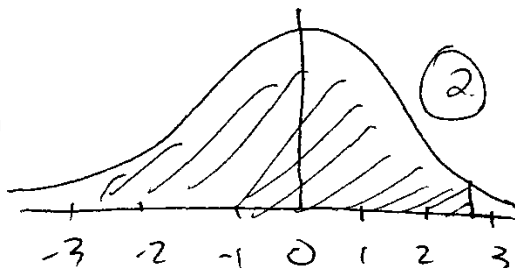
In each part of problem #1, (i) write the probability in terms of X [for example, $P(X \geq 100)$], (ii) write the probability in terms of Z and **draw the picture**, and (iii) find the answer.

1. The performance ratings for a population of employees at a large factory are normally distributed with mean 50 and standard deviation 10. If one person is selected at random, what is the probability that his/her score is

a) below 76?

(i) $P(X < 76)$ (2)

$(\frac{76-50}{10} = 2.6)$



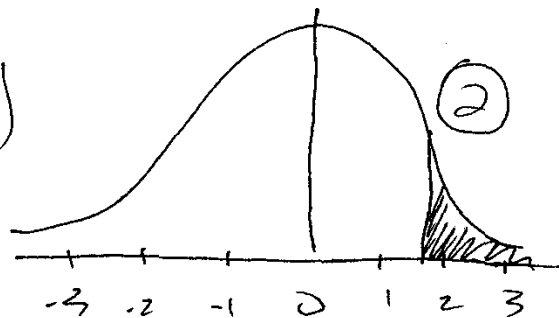
(ii) $P(Z < 2.6)$ (2)

(iii) .9953 (2)

b) above 68?

(i) $P(X > 68)$ (2)

$(\frac{68-50}{10} = 1.8)$



(ii) $P(Z > 1.8)$ (2)

(iii) .0359 (2) $(1 - .9641)$

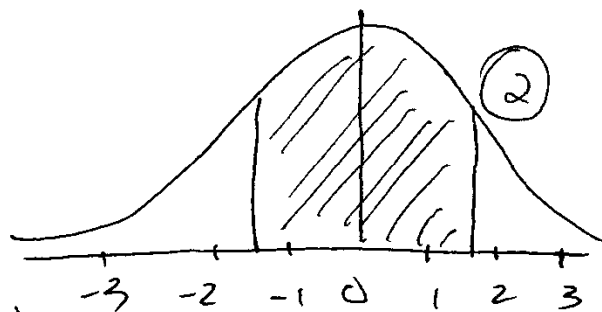
c) between 35 and 65?

(i) $P(35 < X < 65)$ (2)

(ii) $P(-1.5 < Z < 1.5)$ (2)

(iii) .8664 (2)

$(.9332 - .0668)$



2. Refer to problem #1. If you wish to give merit bonuses to the top 4% of the employees, what rating should you use as your cutoff? (In other words, find the 96th percentile.)

(6)

$Z = 1.75$

67.5

$X = \mu + \sigma z = 50 + 10(1.75) = 67.5$