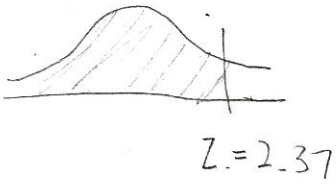
Math 160 Professor Busken
Chapter 6 Worksheet **Name:** Key

Use Table A-2 to answer the following questions.

1. Find the probability $P(z < 2.37)$.



0.9911

2. Find the area between $z = -1.51$ and $z = 2.37$.

$P(-1.51 < z < 2.37) = P(z < 2.37) - P(z < -1.51) = 0.9911 - 0.0655 = \boxed{0.9256}$

3. Find the probability $P(z > 2.37)$.

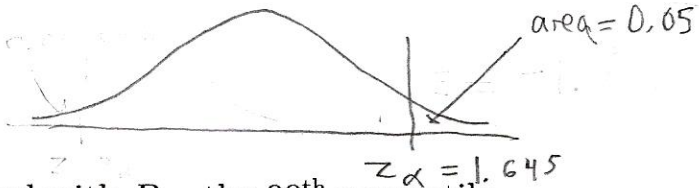
$P(z > 2.37) = 1 - P(z < 2.37) = 1 - 0.9911 = 0.0089$

4. Find the z-score associated with a probability value of 0.8461.

$z = 1.02$

5. Find z_α if $\alpha = 0.05$.

What z value has a cumulative area to the right which equals 0.05?



6. Find the z-score associated with P_{90}, the 90th percentile.

7. Find the probability $P(-1.2 < z < 0.18)$.

$= P(z < 0.18) - P(z < -1.2) = 0.5714 - 0.1151 = 0.4563$

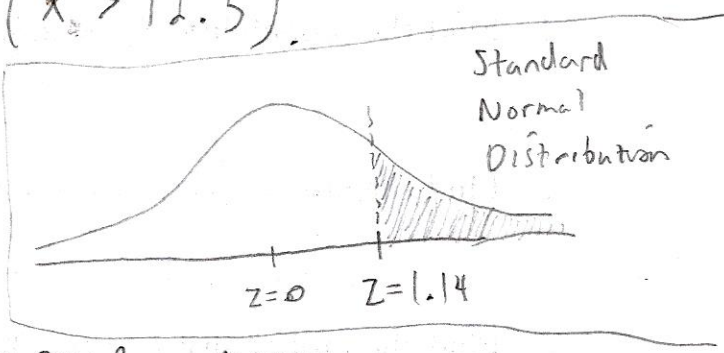
8. Find the probability $P(z > -0.12)$.

$= 1 - P(z < -0.12) = 1 - 0.4562 = 0.5438$

9. Find z_α if $\alpha = 0.15$.

10. The amount of coffee dispensed by a drink vending machine is normally distributed with a mean of 12.0 oz and a standard deviation of .44 oz. What is the probability that a randomly selected cup of coffee has more than 12.5 oz.?

Given $\begin{cases} \mu = 12\text{oz.} \\ \sigma = 0.44\text{oz.} \end{cases}$, find $P(x > 12.5)$.



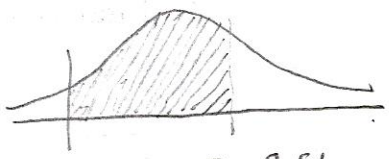
$$P(x > 12.5) = P\left(z > \frac{12.5 - 12.0}{0.44}\right)$$

$$= P(z > 1.14)$$

$$= 1 - P(z < 1.14) = 1 - 0.8729 = 0.1271$$

11. The scores on a math placement exam are normally distributed with a mean of 120.6 points and a standard deviation of 15.5 points. If a student is chosen at random to take this test, what is the probability that he will score between 98.0 points and 130.0 points?

$\mu = 120.6$
$\sigma = 15.5$; find $P(98 < x < 130)$



$$P(98 < x < 130) = P\left(\frac{98 - 120.6}{15.5} < z < \frac{130 - 120.6}{15.5}\right)$$

$$= P\left(\frac{-22.6}{15.5} < z < \frac{9.4}{15.5}\right)$$

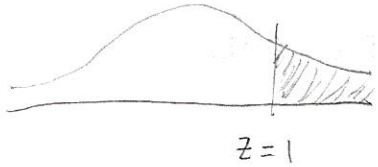
$$= P(-1.46 < z < 0.61) = P(z < 0.61) - P(z < -1.46) = 0.7291 - 0.0721$$

$$= 0.6570$$

12. Assume that x has a normal distribution, and find the indicated probability. The mean is $\mu = 15.2$ and the standard deviation is $\sigma = 0.9$. Find the probability that x is greater than 16.1.

$$P(x > 16.1) = P\left(z > \frac{16.1 - 15.2}{0.9}\right)$$

$$= P\left(z > \frac{0.9}{0.9}\right)$$



$$= P(z > 1) = 1 - P(z < 1) = 1 - 0.8413 = 0.1587$$