

**Key for Chapter 3 problems 3.28, 3.30, and 3.44.  
Graded out of 30 points.**

**3.28)** Given that 70 is exactly 2 standard deviations below the mean, 100, we know by the 68-96-99.7 rule that roughly 95% of all individuals have IQs between 70 and 130. Hence, 5% have IQs that are either below 70 or above 130. Since the distribution is symmetric, **2.5%** of the individuals have IQs below 70.

- 3.30)** a)  $z \leq -2.25$  The value on the table is .0122. Hence, **1.22%** fall below -2.25.  
b)  $z \geq -2.25$  Since 1.22% fall below -2.25 we know  $100 - 1.22 = \mathbf{98.78\%}$  fall above -2.25.  
c)  $z > 1.77$  The value on the table is .9616. Hence, 96.16% fall below 1.77 implying that  $100 - 96.16 = \mathbf{3.84\%}$  fall above 1.77.  
d)  $-2.25 < z < 1.77$  Since 96.16% fall below 1.77 and 1.22% fall below -2.25, the percent between the two is  $96.16 - 1.22 = \mathbf{94.94\%}$  fall between -2.25 and 1.77.

**3.44** We want the percent of women who are taller than 69.3. Since women is  $N(64, 2.7)$  we can find the percent greater than 69.3 by standardizing. The z-score for 69.3 is  $(69.3 - 64)/2.7 = 1.96$ . The score associated with 1.96 on the z-table is .9750. This means that 97.5% of women are shorter than 69.3 implying that **2.5%** are taller.

**COMMON MISTAKES**

- 1) The most obvious mistake was also the most common. Keep track of whether you want values less than or greater than your z-score when standardizing. The table ALWAYS gives < information. When a question asks you for > you will need to subtract from 100. **(This occurred a lot on 3.30 and cost 2 pts each.)**
- 2) On 3.44 many used the incorrect standard deviation. Since we are wondering about how many women are greater than a certain height we want to use the women's standard deviation.