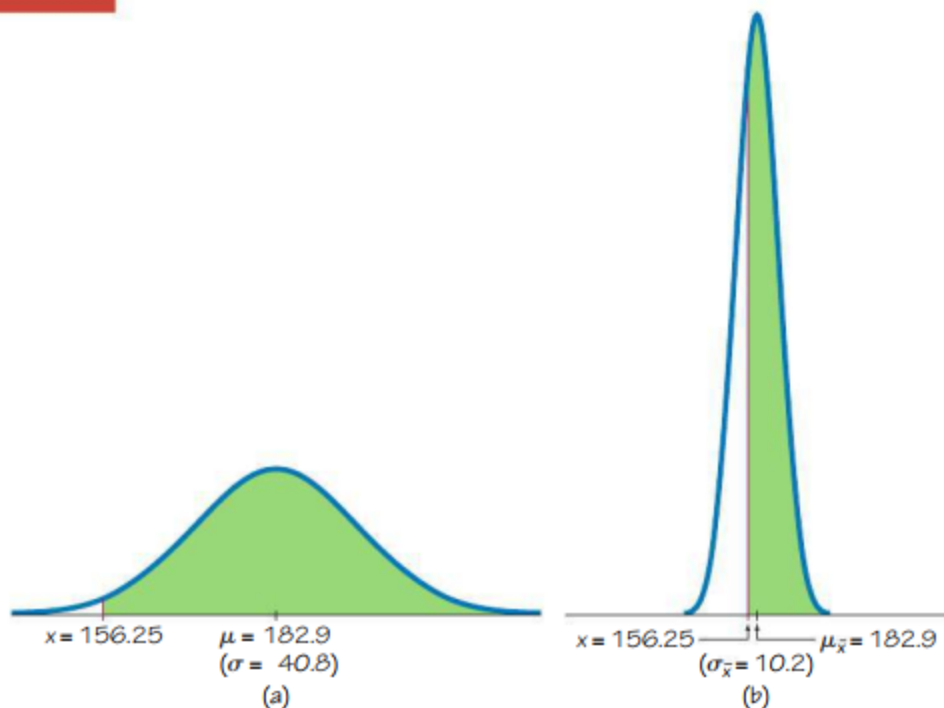


- Find the probability that 1 randomly selected adult male has a weight greater than 156.25 lb.
- Find the probability that a sample of 16 randomly selected adult males has a mean weight greater than 156.25 lb (so that the total weight exceeds the maximum capacity of 2500 lb).

Solution**Figure 6-16** Elevator Weights

- Approach Used for an Individual Value:** Use the methods presented in Section 6-3 (because we are dealing with an *individual* value from a normally distributed population). We seek the area of the green-shaded region in Figure 6-16(a). If using technology (as described at the end of Section 6-3), we find that the green-shaded area is 0.7432. If using Table A-2, we convert the weight of $x = 156.25$ lb to the corresponding z score of $z = -0.65$ as shown here:

$$z = \frac{x - \mu}{\sigma} = \frac{156.25 - 182.9}{40.8} = -0.65$$

We refer to Table A-2 to find that the cumulative area to the *left* of $z = -0.65$ is 0.2578, so the green-shaded area in Figure 6-16 (a) is $1 - 0.2578 = 0.7422$. (The result of 0.7432 from technology is more accurate than the result found from Table A-2.)

- Approach Used for the Mean of Sample Values:** Use the central limit theorem (because we are dealing with the *mean* of a *sample* of 16 males, not an individual male).

Requirement check We can use the normal distribution if the original population is normally distributed or $n > 30$. The sample size is not greater than 30,