

ANSWER to Question #84594, Math / Statistics and Probability

We know that if random variable

$$X \sim N(\mu, \sigma^2) \text{ then } Z = \frac{X - \mu}{\sigma} \sim N(0,1)$$

$$\text{given weight } W \sim N(55, 5^2) \text{ then } Z = \frac{W - 55}{5} \sim N(0,1)$$

(i) to calculate  $P(60.5 < W < 64.5)$

$$\begin{aligned} P(60.5 < W < 64.5) &= P\left(\frac{60.5 - 55}{5} < \frac{W - 55}{5} < \frac{64.5 - 55}{5}\right) \\ &= P(1.1 < Z < 1.9) \\ &= .9713 - .8643 = 0.107 \end{aligned}$$

(ii) to calculate  $P(W > 65)$

$$\begin{aligned} P(W > 65) &= P\left(\frac{W - 55}{5} > \frac{65 - 55}{5}\right) \\ &= P(Z > 2) \\ &= 1 - 0.9772 = 0.0228 \end{aligned}$$

