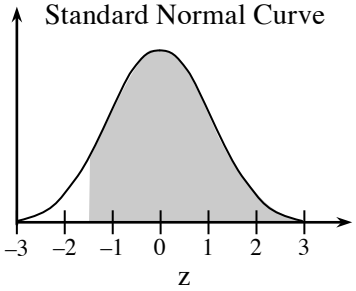
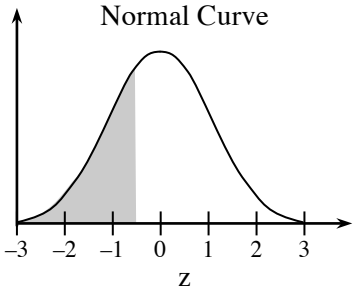
Lesson 5.2.2

5-35. $z = \frac{75.09-78.28}{2.13} = -1.50$;
$P(z > -1.50)$ = normalcdf(–1.5, 10^99, 0, 1);
$P(z > -1.50) = 0.9332$; $P(X > 75.09)$ = normalcdf(75.09, 10^99, 78.28, 2.13) = 0.9329. See graph at right.



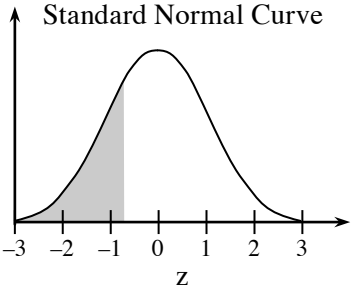
5-36. $z = \frac{343.61-396.53}{105.84} = -0.5$;
$P(z < -0.5)$ = normalcdf(–10^99, –0.5, 0, 1);
$P(z < -0.5) = 0.3085$; $P(X < 343.61)$ =
normalcdf(–10^99, 343.61, 396.53, 105.84) = 0.3085. See graph below.

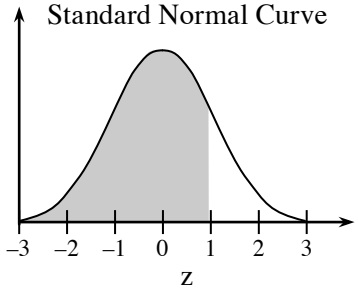


5-37. a. Raymond's calculator functions require unique mean and standard deviation as inputs but his dad's method always uses 0 and 1 for those measures.

b. z_1 = invNorm(0.21, 0, 1) = –0.80663; z_2 = invNorm(0.83, 0, 1) = 0.95411

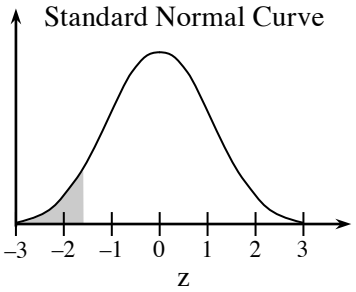
c.

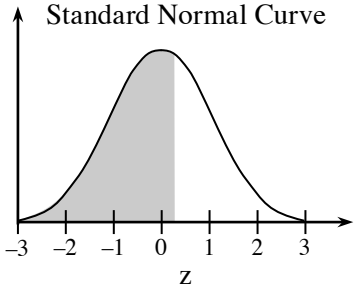




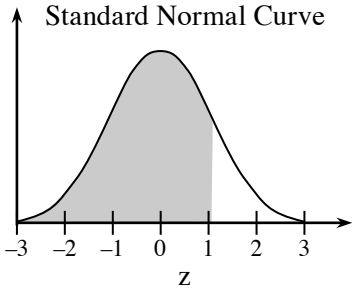
d. $-0.80663 = \frac{2.5389-\mu}{\sigma}$; $2.5389 = \mu + (-0.80663)\sigma$; $0.95411 = \frac{3.2027-\mu}{\sigma}$;
$3.2027 = \mu + (0.95411)\sigma$; $\mu = 2.843$ lbs; $\sigma = 0.377$ lbs.

5-38. 5^{th} percentile: $z_1 = \text{invNorm}(0.05, 0, 1) = -1.64493$;
$-1.64493 = \frac{54.685-\mu}{\sigma}$; $54.685 = \mu + (-1.64493)\sigma$. See graph below left.
60^{th} percentile: $z_2 = \text{invNorm}(0.60,0,1) = 0.25333$; $0.25333 = \frac{61.234-\mu}{\sigma}$;
$61.234 = \mu + (0.25333)\sigma$. See graph below right. $\mu = 60.36$ bpm; $\sigma = 3.45$ bpm.

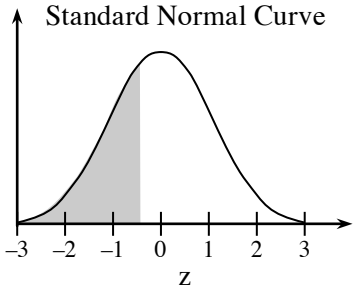


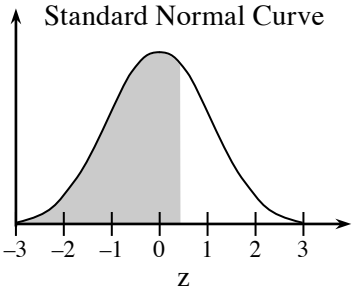


5-39. $z_1 = \text{invNorm}(0.85, 0, 1) = 1.0365$;
$1.0365 = \frac{80.431-73.02}{\sigma}$; $\sigma = \frac{80.431-73.02}{1.0365} \approx 7.150$ cm.
See graph at right.



5-40. 33^{rd} percentile: $z_1 = \text{invNorm}(0.33, 0, 1) = -0.440$;
$-0.440 = \frac{6.775-\mu}{\sigma}$; $6.775 = \mu + (-0.440)\sigma$. See graph below left. 65^{th} percentile: $z_2 = \text{invNorm}(0.65, 0, 1) = 0.38533$; $0.38533 = \frac{7.394-\mu}{\sigma}$; $7.394 = \mu + (0.38533)\sigma$.
See graph below right. $\mu = 7.105$ rating; $\sigma = 0.75$ rating.





5-41. a. $P(X < 100) = \text{normalcdf}(-10\text{^}99, 100, 185, 36) \approx 0.0091$

b. $P(X > 250) = \text{normalcdf}(250, 10\text{^}99, 185, 36) \approx 0.035$

c. $P(X < 160) = \text{normalcdf}(-10\text{^}99, 160, 185, 36) \approx 0.244$ or the 24^{th} percentile

5-42. a. An observational study is all that is necessary since researchers would simply need to observe the online behavior of students.

b. A stratified random sample will account for the differences between boys and girls. Divide the students at City High into two groups based on gender and take a simple random sample from each. Ask students in the sample whether or not they have met a friend online.