AMS102: HOMEWORK 4

SOLUTIONS

Chapter 6

6.7. (a) $\dfrac{680-500}{100} = 1.8$

(b) $\dfrac{27-18}{6} = 1.5$

(c) Eleanor

6.14. Standard score (z-score) for 55: $\dfrac{55-62}{11} \approx -0.64$. Percentage($z < -0.64$) $\approx 24\%$. You passed.

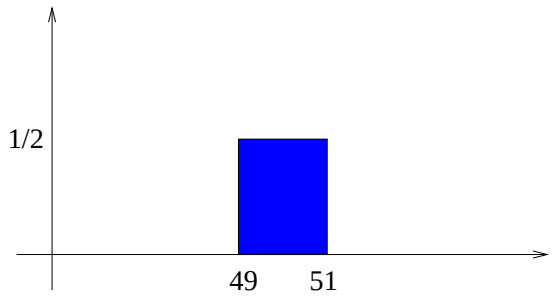
6.17. The z-score for the quickest 5%: up to approximately -1.645. Duration: $-1.645 \cdot 5 + 30 \approx 21.78$ minutes.

6.24. (a) Z-scores for 454 and 474: $\dfrac{454-464}{8} = -1.25$, $\dfrac{474-464}{8} = 1.25$. Percentage($z < -1.25$) $= 10.56\%$, percentage($z < 1.25$) $= 89.44\%$. Percentage($-1.25 < z < 1.25$) $= 89.44 - 10.56 = 78.88\%$.

(b) Z-score for top 10% (same as for bottom 90%): about 1.281. $1.281 \cdot 8 + 464 \approx 474$ grams. Answer: more than 474 grams.

(c) If the standard deviation gets smaller, more values are concentrated near the mean. Hence, the percentage will increase.

6.38. (a) Height: $1/(51-49) = 1/2$.



(b) One half (50 is the median).

(c) Range: 49−51. Median: 50. Q1: (49+50)/2 = 49.5; Q3: (50+51)/2 = 50.5. IQR: $50.5 - 49.5 = 1$.

6.47. (a) Proportion for both 10" and 14": $1 - 0.2 - 0.4 - 0.2 = 0.2$. Proportion for each: 0.1

(b) $0.1 + 0.2 = 0.3$.

6.52. (a) Z-score for 2: $\dfrac{2 - 1.8}{2} = 0.1$. Proportion$(z < 0.1) = 0.5398$.

(b) $P(T = 1.8) + P(T = 2.1) = 1 - \frac{7}{20} - \frac{5}{20} = \frac{8}{20}$. Using $2P(T = 1.8) = P(T = 2.1)$, get $P(T = 1.8) = \frac{8}{60}, P(T = 2.1) = \frac{8}{30}$.

$P(T > 2) = P(T = 2.1) = \frac{8}{30}$.

(c) Proportion$(L > 2) = \dfrac{4 - 2}{4 - 1.8} = \dfrac{10}{11}$.