

Stat 145 Homework Solutions: Chapter 3

Problem 3.7

- (a) Within 2 standard deviations of the mean: $266 \pm 2(16)$, or 234 to 298 days.
- (b) The middle 95% fall between 234 and 298. This leaves 5% left over, or 2.5% in each tail. Thus the shortest 2.5% of all pregnancies are less than 234 days.

Problem 3.9

For women: $z = \frac{72-64}{2.7} \approx 2.96$

For men: $z = \frac{72-69.3}{2.8} \approx 0.96$

A height of 6 feet is 2.96 standard deviations above average for a woman but only 0.96 standard deviations above average for a man.

Problem 3.10

- (a) 0.9978
- (b) $1 - 0.9978 = 0.0022$
- (c) $1 - 0.0485 = 0.9515$
- (d) $0.9515 - 0.022 = 0.9493$

Problem 3.11 (ab)

(a) $z = \frac{0.40-0.37}{0.04} = 0.75$

Answer using Table A: $1 - 0.7734 = 0.2266$

(b) $z_1 = \frac{0.40-0.37}{0.04} = 0.75$ and $z_2 = \frac{0.50-0.37}{0.04} = 3.25$

Answer using Table A: $0.9994 - 0.7734 = 0.2260$

Problem 3.12

- (a) Find the closest value to 0.25 in the body of Table A: $z \approx -0.67$.
- (b) Find the closest value to $1 - 0.40 = 0.60$ in the body of Table A: $z \approx 0.25$.

Problem 3.13

(a) Find the closest value to 0.25 in the body of Table A: $z \approx -0.67$. Then use the formula $x = \mu + (z)(\sigma)$: $x = 100 + (-0.67)(15) \approx 90$.

(b) Find the closest value to $1 - 0.05 = 0.95$ in the body of Table A: $z \approx 1.64$ or $z \approx 1.65$ (the exact value is $z = 1.645$). Then use the formula $x = \mu + (z)(\sigma)$: $x = 100 + (1.645)(15) \approx 125$.

Problem 3.18

(a) 0.0122

(b) $1 - 0.0122 = 0.9878$

(c) $1 - 0.9616 = 0.0384$

(d) $0.9616 - 0.0122 = 0.9494$

Problem 3.19

(a) Find the closest value to 0.8 in the body of Table A: $z \approx 0.84$.

(b) Find the closest value to $1 - 0.35 = 0.65$ in the body of Table A: $z \approx 0.39$.

Problem 3.23

$$z = \frac{64-69.3}{2.8} \approx -1.89$$

Answer using Table A: 0.0294.

Problem 3.25

$$(a) z = \frac{750-534}{116} \approx 1.86$$

Answer using Table A: $1 - 0.9686 = 0.0314$, or 3.14%.

$$(b) z = \frac{750-500}{110} \approx 2.27$$

Answer using Table A: $1 - 0.9884 = 0.0116$, or 1.16%.