

Chapter 1:

Section 1.1:

- 1.) See solutions
- 3.) See solutions
- 5.) See solutions
- 7.) See solutions
- 9.) a.) ratio, b.) nominal, c.) interval, d.) ordinal

Section 1.2:

- 1.) a.) Cluster sample, b.) Systematic sample, c.) Convenience sample, d.) Simple random sample, e.) Stratified sample
- 3.) See solutions
- 5.) See solutions
- 7.) See solutions

Section 1.3:

- 1.) Experiment
- 3.) Observation
- 5.) No, see solutions
- 7.) No, see solutions
- 9.) Yes, see solutions
- 11.) Yes, see solutions
- 13.) Double blind, see solutions
- 15.) Blind, see solutions
- 17.) Prospective, see solutions
- 19.) Retrospective, see solutions
- 21.) See solutions

Section 1.4: See solutions

Chapter 2: See solutions

Chapter 3:

Section 3.1:

- 1.) mean = 253.93, median = 268, mode = none
- 3.) mean = 67.68 km, median = 64 km, mode = 56 and 64 km
- 5.) a.) mean = \$89,370.42, median = \$75,311, b.) mean = \$79,196.56, median = \$74,773, c.) See solutions, d.) See solutions, e.) See solutions
- 7.) a.) ordinal- median and mode, b.) ratio – all three, c.) interval – all three, d.) nominal – mode
- 9.) Skewed right, mean higher
- 11.) 2.71
- 13.) 76.75

Section 3.2:

- 1.) mean = 253.93, median = 268, range = 218, variance = 2276.29, st dev = 47.71
- 3.) a.) mean = 67.68 km, median = 64 km, b.) range = 145 km, c.) variance = 1107.9416 km², st dev = 33.29 km
- 5.) mean = \$89,370.42, median = \$75,311, range = \$219,782, variance = 2298639399, st dev = \$47,944.13
- 7.) See solutions
- 9.) $\bar{x}_1 \approx 75.45, s_1 \approx 11.10, \bar{x}_2 \approx 125.55, s_2 \approx 24.72$

11.) a.) $\bar{x} \approx 21.24$ sec, $s \approx 14.95$ sec, b.) $(-8.66$ sec, 51.14 sec), c.)

$(-23.61$ sec, 66.09 sec)

13.) $\bar{x} \approx 130.98$, $s \approx 205.44$, b.) $(-279.90$, $541.86)$, c.) $(-485.34$, $747.3)$

15.) 3.61

17.) 10.35

Section 3.3: Note: Q1, Q3, and IQR may differ slightly due to how technology finds them.

1.) See solutions

3.) See solutions

5.) min = 142, Q1 = 225, med = 268, Q3 = 282, max = 360, IQR = 57, see solutions

7.) min = 32 km, Q1 = 46 km, med = 64 km, Q3 = 77 km, max = 177 km, IQR = 31 km, see solutions

9.) See solutions

11.) See solutions

Chapter 4:

Section 4.1:

1.) $P(\text{blue}) = 0.184$, $P(\text{brow}) = 0.142$, $P(\text{green}) = 0.184$, $P(\text{orange}) = 0.208$, $P(\text{red}) = 0.142$, $P(\text{yellow}) = 0.141$

3.) $P(\text{indigenous person dies}) = 0.0058$, $P(\text{non-indigenous person dies}) = 0.0029$, see solutions

Section 4.2:

1.) a.) $P(\text{green or red}) = 0.326$, b.) $P(\text{blue, red, or yellow}) = 0.466$, c.) $P(\text{not brown}) = 0.858$, d.) $P(\text{not green}) = 0.816$

3.) a.) See solutions, b.) $P(2 \text{ heads}) = 0.375$, c.) $P(\text{at least 2 heads}) = 0.50$, d.) $P(\text{odd number of heads}) = 0.50$, e.) $P(\text{all heads or all tails}) = 0.25$, f.) $P(\text{two heads or two tails}) = 0.75$, g.) $P(\text{no an odd number of heads}) = 0.50$

5.) a.) See solutions, b.) $P(\text{sum of 3}) = 0.056$, c.) $P(1^{\text{st}} \text{ die a 4}) = 0.167$, d.) $P(\text{sum of 8}) = 0.139$, e.) $P(\text{sum of 3 or sum of 8}) = 0.194$, f.) $P(\text{sum of 3 or } 1^{\text{st}} \text{ die a 4}) = 0.222$, g.) $P(\text{sum of 8 or } 1^{\text{st}} \text{ die a 4}) = 0.278$, h.) $P(\text{not getting a sum of 8}) = 0.861$

7.) $P(\text{red ball}) = 0.625$, b.) $P(\text{blue ball}) = 0.375$, c.) 5 to 3, d.) 3 to 5

Section 4.3:

1.) Independent, see solutions

3.) Dependent, see solutions

5.) a.) $P(\text{Jack/face card}) = 0.333$, b.) $P(\text{heart/card a 3}) = 0.25$, c.) $P(\text{red card/ace}) = 0.50$, d.) not independent, see solutions, e.) independent, see solutions

7.) 0.0625

9.) 4.55×10^{-4}

11.) a.) $P(\text{female}) = 0.684$, b.) $P(1^{\text{st}} \text{ class}) = 0.429$, c.) $P(\text{female}/1^{\text{st}} \text{ class}) = 0.694$, d.)

$P(\text{female and } 1^{\text{st}} \text{ class}) = 0.298$, e.) $P(\text{female or } 1^{\text{st}} \text{ class}) = 0.816$, f.) No, see solutions, g.) Dependent, see solutions

Section 4.4:

1.) 30 meals

3.) 120 shirts

5.) 3024

7.) 252

9.) 1320

11.) 10

Chapter 5:

Section 5.1:

1.) a.) See solutions, b.) See solutions, c.) 4.175 days, d.) 8.414375 days^2 , e.) 2.901 days, f.) 0.004, g.) See solutions, h.) See solutions

3.) -\$0.75

Section 5.2:

1.) a.) $P(x=5) = 0.0212$, b.) $P(x=8) = 1.062 \times 10^{-4}$, c.) $P(x=12) = 1.605 \times 10^{-9}$, d.) $P(x \leq 4) = 0.973$, e.) $P(x \geq 8) = 1.18 \times 10^{-4}$, f.) $P(x \leq 12) = 0.99999$

3.) a.) $P(x=2) = 0.0014$, b.) $P(x=8) = 0.2335$, c.) $P(x=7) = 0.2668$, d.) $P(x \leq 3) = 0.0106$, e.) $P(x \geq 7) = 0.6496$, f.) $P(x \leq 4) = 0.0473$

5.) a.) $P(x=8) = 0.0784$, b.) $P(x=15) = 0.0182$, c.) $P(x=14) = 0.0534$, d.) $P(x \leq 12) = 0.8142$, e.) $P(x \geq 10) = 0.7324$, f.) $P(x \leq 7) = 0.0557$

7.) a.) See solutions, b.) See solutions, c.) $P(x=0) = 0.2059$, d.) $P(x=7) = 2.770 \times 10^{-4}$, e.) $P(x \geq 2) = 0.4510$, f.) $P(x \leq 3) = 0.9444$, g.) $P(x \geq 7) = 3.106 \times 10^{-4}$, h.) See solutions

9.) a.) See solutions, b.) See solutions, c.) $P(x=0) = 0.0247$, d.)

$P(x=20) = 3.612 \times 10^{-16}$, e.) $P(x \geq 3) = 0.6812$, f.) $P(x \leq 5) = 0.8926$, g.)

$P(x \geq 10) = 6.711 \times 10^{-4}$, h.) See solutions

Section 5.3:

1.) a.) See solutions, b.) See solutions, c.) Skewed right, d.) 0.78, e.) 0.6786, f.) 0.8238

3.) a.) See solutions, b.) See solutions, c.) Symmetric, d.) 3.5, e.) 1.75, f.) 1.3229

5.) a.) See solutions, b.) See solutions, c.) See solutions, d.) Skewed right, e.) 2.88, f.) 2.1888, g.) 1.479

7.) a.) See solutions, b.) 7.28, c.) 6.2608, d.) 2.502

Chapter 6:

Section 6.1:

1.) a.) See solutions, b.) $P(2 < x < 5) = 0.3$, c.) $P(7 < x < 10) = 0.3$, d.) $P(x=8) = 0$

Section 6.3:

1.) a.) $P(z < 2.36) = 0.9909$, b.) $P(z > 0.67) = 0.2514$, c.) $P(0 < z < 2.11) = 0.4826$, d.) $P(-2.78 < z < 1.97) = 0.9729$

3.) a.) -0.6667, b.) -2.6667, c.) -2, d.) 6.6667

5.) a.) See solutions, b.) $P(x < 52 \text{ cm}) = 0.7128$, c.) $P(x > 74 \text{ cm}) = 5.852 \times 10^{-11}$, d.) $P(40.5 \text{ cm} < x < 57.5 \text{ cm}) = 0.9729$, e.) See solutions, f.) 53.8 cm

7.) a.) See solutions, b.) $P(x > 110 \text{ g}) = 0.0551$, c.) $P(x < 93 \text{ g}) = 0.0097$, d.)

$P(x < 65 \text{ g}) \approx 0$ or 5.57×10^{-19} , e.) See solutions, f.) 110.2 g

9.) a.) See solutions, b.) $P(x > \$80,000) = 0.1168$, c.) $P(x > \$80,000) = 0.2283$, d.)

$P(\$55,000 < x < \$72,000) = 0.5519$, e.) See solutions, f.) \$73,112

Section 6.4:

1.) Normally distributed

3.) Normally distributed

Section 6.5:

1.) a.) See solutions, b.) $\mu_{\bar{x}} = 14$, $\sigma_{\bar{x}} = 0.9487$, c.) See solutions, d.) $\mu_{\bar{x}} = 14$, $\sigma_{\bar{x}} = 0.5071$

3.) a.) See solutions, b.) $\mu_{\bar{x}} = \$67,694$, c.) $\sigma_{\bar{x}} = \$1594.42$, d.) See solutions, e.) $P(\bar{x} > \$75,000) = 2.302 \times 10^{-6}$, f.) $P(\bar{x} < \$60,000) = 6.989 \times 10^{-7}$, g.) See solutions

5.) a.) See solutions, b.) $\mu_{\bar{x}} = 49.9$ cm, c.) $\sigma_{\bar{x}} = 0.9657$ cm, d.) See solutions, e.) $P(\bar{x} < 52 \text{ cm}) = 0.9852$ f.) $P(\bar{x} > 74 \text{ cm}) \approx 0$, g.) See solutions

7.) a.) See solutions, b.) $P(\bar{x} > 100 \text{ g}) = 0.99999$, c.) $P(\bar{x} < 93 \text{ g}) \approx 0$ or 8.22×10^{-44} , d.) See solutions

Chapter 7:

Section 7.1:

1.) $H_o : p = 0.11, H_A : p > 0.11$

3.) $H_o : \mu = 4.87$ metric tons per capita, $H_A : \mu < 4.87$ metric tons per capita

5.) See solutions

7.) See solutions

Section 7.2:

For all hypothesis tests, just the conclusion is given. See solutions for the entire answer.

1.) Reject H_o .

3.) Reject H_o .

5.) Reject H_o .

Section 7.3:

For all hypothesis tests, just the conclusion is given. See solutions for the entire answer.

1.) Fail to reject H_o .

3.) Fail to reject H_o .

5.) Fail to reject H_o .

7.) Reject H_o .

Chapter 8:

Section 8.1:

1.) Narrower

3.) Narrower

5.) See solutions

7.) See solutions

Section 8.2:

For all confidence intervals, just the interval using technology is given. See solution for the entire answer.

1.) $0.1641 < p < 0.1745$

3.) $0.4458 < p < 0.4739$

5.) $0.5740 < p < 0.6452$

Section 8.3:

For all confidence intervals, just the interval using technology is given. See solution for the entire answer.

- 1.) $1.7944 < \mu < 5.1152$ metric tons per capita
- 3.) $0.44872 < \mu < 0.60562$ mg/kg
- 5.) $87.2423 < \mu < 113.795$ beats/min
- 7.) $88.8747\% < \mu < 93.0253\%$

Chapter 9:

Answers to all problems are given.

Section 9.1:

For all hypothesis tests, just the conclusion is given. For all confidence intervals, just the interval using technology (Software R) is given. See solution for the entire answer.

- 1.) Reject H_0
- 2.) $0.0941 < p_1 - p_2 < 0.0996$
- 3.) Reject H_0
- 4.) $-0.0332 < p_1 - p_2 < -0.0282$
- 5.) Fail to reject H_0
- 6.) $-0.01547 < p_1 - p_2 < -0.0001$
- 7.) Reject H_0
- 8.) $0.0840 < p_1 - p_2 < 0.1696$

Section 9.2:

For all hypothesis tests, just the conclusion is given. For all confidence intervals, just the interval using technology is given. See solution for the entire answer.

- 1.) Reject H_0
- 2.) $5.39857 \text{ mg/dL} < \mu_d < 41.1729 \text{ mg/dL}$
- 3.) Fail to reject H_0
- 4.) $-\$3.24216 < \mu_d < \8.13327
- 5.) Reject H_0
- 6.) $1154.09 < \mu_d < 2517.51$
- 7.) Reject H_0
- 8.) $1.499 < \mu_d < 3.001$
- 9.) Fail to reject H_0
- 10.) $-10.9096\% < \mu_d < 0.2596\%$
- 11.) Reject H_0
- 12.) $-62.0438 \text{ beats/min} < \mu_d < -37.1141 \text{ beats/min}$

Section 9.3:

For all hypothesis tests, just the conclusion is given. For all confidence intervals, just the interval using technology is given. See solution for the entire answer.

- 1.) Reject H_0
- 2.) $\$65443.80 < \mu_1 - \mu_2 < \13340.80
- 3.) Fail to reject H_0
- 4.) $-51564.6 \text{ mm}^3 < \mu_1 - \mu_2 < 75656.6 \text{ mm}^3$
- 5.) Reject H_0
- 6.) $23.2818 \text{ km} < \mu_1 - \mu_2 < 103.67 \text{ km}$
- 7.) Reject H_0
- 8.) $4.3641 < \mu_1 - \mu_2 < 37.5276$

- 9.) Fail to reject H_0
- 10.) $-10.9726 \text{ s} < \mu_1 - \mu_2 < 11.3059 \text{ s}$
- 11.) Reject H_0
- 12.) $\$6544.98 < \mu_1 - \mu_2 < \13339.60
- 13.) Reject H_0
- 14.) $4.8267 < \mu_1 - \mu_2 < 37.0649$
- 15.) Fail to reject H_0
- 16.) $-10.9713 \text{ s} < \mu_1 - \mu_2 < 11.3047 \text{ s}$

Chapter 10:

Section 10.1:

For regression, only the equation is given. See solutions for the entire answer.

- 1.) $\hat{y} = 1.719x + 93.709$
- 3.) $\hat{y} = -4.706x + 84.873$
- 5.) $\hat{y} = 5.859x - 230.942$
- 7.) $\hat{y} = 4.0133x - 228.3313$
- 9.) $\hat{y} = 0.12182x + 1.08608$

Section 10.2:

Only the correlation coefficient and coefficient of determination are given. See solutions for the entire answer.

- 1.) $r = 0.9578, r^2 = 0.7357$
- 3.) $r = -0.9313, r^2 = 0.8674$
- 5.) $r = 0.6605, r^2 = 0.4362$
- 7.) $r = 0.8871, r^2 = 0.7869$
- 9.) $r = 0.7036, r^2 = 0.4951$
- 11.) No, see solutions.
- 13.) No, see solutions.

Section 10.3:

For hypothesis test just the conclusion is given. See solutions for entire answer.

- 1.) a.) Reject H_0 , b.) $s_e \approx 4.559$, c.) $151.3161 \text{ cm} < y < 187.3859 \text{ cm}$
- 3.) a.) Reject H_0 , b.) $s_e \approx 3.204$, c.) $62.945 \text{ years} < y < 81.391 \text{ years}$
- 5.) a.) Reject H_0 , b.) $s_e \approx 15.33$, c.) $176.02 \text{ inches} < y < 240.92 \text{ inches}$
- 7.) a.) Reject H_0 , b.) $s_e \approx 48.58$, c.) $348.46 \text{ mg} < y < 559.38 \text{ mg}$
- 9.) a.) Reject H_0 , b.) $s_e \approx 0.6838$, c.)
 $1.613 \text{ hundred thousand} < y < 5.432 \text{ hundred thousand}$

Chapter 11:

Section 11.1:

For all hypothesis tests, just the conclusion is given. See solutions for the entire answer.

- 1.) Reject H_0
- 3.) Reject H_0
- 5.) Reject H_0
- 7.) Reject H_0

Section 11.2:

For all hypothesis tests, just the conclusion is given. See solutions for the entire answer.

- 1.) Reject H_0
- 3.) Reject H_0
- 5.) Reject H_0

Section 11.3:

For all hypothesis tests, just the conclusion is given. See solutions for the entire answer.

- 1.) Reject H_0
- 3.) Reject H_0
- 5.) Fail to reject H_0

