

MATH 10043 ELEMENTARY STATISTICS SPRING 2013
ANSWERS TO SELECTED PROBLEMS, UNIT 2

Chapter 4

Section 4.2

(6) 0.80 **(12)** 1 (a certain event) **(14a)** 1 **(14b)** 0 **(14c)** $1/10 = 0.1$ **(14d)** $\frac{1}{2} = 0.5$ **(14e)** $1/5 = 0.2$

Practice problems on example sheet: 1. $S = \{H1, H2, H3, H4, H5, H6, T1, T2, T3, T4, T5, T6\}$

(2a) 0.503 **(2b)** 0.650 **(2c)** 0.895 **(2d)** 0.068

Section 4.3

(2) Yes. If one event is the complement of another, the events must be disjoint.

(14) $P(\text{not colorblind}) = 0.9975$ or 0.998

(16) The probability that a screened driver is not intoxicated ; 0.99112 or 0.991

(18) $P(\text{did not lie}) = 0.480$ **(20)** $P(P \text{ or } L) = 0.847$ **(28)** $P(60+ \text{ and responded}) = 0.168$

(30) $P(60+ \text{ or refused}) = 0.297$ **(32)** 0.368

Practice problems: **(1a)** 0.037 **(1b)** 0.652 **(2a)** 0.08 **(2b)** No, because $P(A \text{ and } B) = 0.08$, not 0.

(3a) No, because this would make $P(\text{Union OR } > \$15 \text{ per hour}) = 1.05$, which is impossible.

(3b) $P(> \$15 \text{ per hour}) = 0.75$

(4a) $P(K \text{ and } L) = 0$ **(4b)** Yes, because $P(K \text{ and } L) = 0$. In other words, K and L have no overlap

5. $P(M) = 0.51$.

Section 4.4

(14) $P(\text{false \& false \& false}) = 15/98 \times 14/97 \times 13/96 = 0.00299$ or 0.003. Yes – a very low probability.

(16) $P(\text{incorrect \& incorrect \& incorrect \& incorrect}) = 24/98 \times 23/97 \times 22/96 \times 21/95 = 0.00294$ or 0.003.

Yes – a very low probability.

(18a) $2/100 \times 2/100 \times 2/100 = 0.00008$ **(18b)** $2/100 \times 1/99 \times 0/98 = 0$

(20a) $4/100 \times 4/100 \times 4/100 = 0.000064$ **(20b)** $4/100 \times 3/99 \times 2/98 = 0.0000247$

(22) Let P be the event that a power supply unit is okay. Then $P(\text{entire batch is accepted}) =$

$P(P_1 \text{ and } P_2 \text{ and } P_3) = 392/400 \times 391/399 \times 390/398 = 0.941$

Practice problems: **(1a)** 5/14 or 0.357 **(1b)** 3/28 or 0.107 **(1c)** 15/28 or 0.536

(2a) 31/60 or 0.517 **(2b)** 3/4 or 0.75 **3.** 19/28 or 0.679 **4.** 0.64 **(5a)** 0.376 **(5b)** 0.048

Section 4.5

(14) 0.135 A problem because false positive results indicate marijuana use when it is not the case
 (16) 0.981 (22) 0.902; no (24) 0.465 **Practice problems on example sheet:** (1a) 0.524
 (1b) 0.486 (2a) 0.308 (2b) 0.633 (2c) because the sample space for each is different.
 3. $P(K | L) = 0$ 4. $P(M \text{ or } N) = 0.7065$ 5. 0.2 6. (a) 0.824 (b) 0.358

Chapter 5**Section 5.2**

Practice problems(1a) x = number of courses taken by a random TCU student (1b) discrete
 (1c) $x = \{1, 2, 3, \dots\}$ (2a) $P(y = 2) = 0.134$ (2b) $P(y \leq 4) = 0.923$ (2c) $P(y > 1) = 0.415$
 (2d) $P(2 \leq y \leq 4) = 0.338$ (2e) $\mu = 1.5, \sigma = 1.7$
 (2f) $P(-0.2 < x < 3.2) = P(x = 0 \text{ or } x = 1 \text{ or } x = 2 \text{ or } x = 3) = 0.830$

Section 5.3

Practice problems: (1) 0.001 (2) 0.791 There is a probability of 0.791 that at most three of a sample of fifteen Fort Worth residents favor an increase in sales tax. (3) 0.956 (4) 0.013 The probability that all 15 of the customers who sampled Tasty Fry Onion Rings made a purchase is 0.013.

Section 5.4

(12a) $\mu = 24.0, \sigma = 4.271$ (16a) $\mu = 266.0, \sigma = 14.124$
Practice problems: (1) $\mu = 1.44, \sigma = 1.14$ (2a) $\mu = 15.6$ (2b) $\sigma = 1.85$
 (3a) $\mu = 1.26, \sigma = 0.85$ (3b) $P(0.41 \leq x \leq 2.11) = P(x = 1 \text{ or } x = 2) = 0.731$

Chapter 6**Section 6.2**

(38) 0.9545 (40) $z = 0.9995$ **Practice Problems:** (1) 1.18 ; 0.58 ; -1.04 ; 1.64

Section 6.3

(16) 0.1613 (20) 105 **Practice Problems:** (1a) 0.111 Approximately 11% of kindergarten children will be under 3 feet (36 inches) tall. (1b) 35.9 to 40.5 inches (1c) 41.2 inches
 (2) GRE score = 557 (3) 20.3 pounds