

Answers to Possible Exam Questions from the Book

| | Chapter | Section | Problem # | Answer |
|----|---------|---------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | 2 | 2.1 | 27 | {1,2,3,4,5,6,7} |
| 2 | 2 | 2.1 | 57 | 16 |
| 3 | 2 | 2.2 | 19 | a. {c,e}, b. {a,b,c,d,f} |
| 4 | 2 | 2.2 | 28 | a. {2,3}, b. {1,5} |
| 5 | 2 | 2.3 | 5 | Diagram Below |
| 6 | 2 | 2.3 | 7 | Diagram Below |
| 7 | 2 | 2.3 | 10 | Regions 5, 6, and 7 |
| 8 | 2 | 2.3 | 29 | Diagram Below |
| 9 | 2 | 2.3 | 37 | a. $A = \{a,b,c,e\}$, $B = \{a,b,g,h\}$ and $U = \{a,b,c,d,e,f,g,h\}$ b. $A \cup B = \{a,b,c,e,g,h\}$ c. $(A \cap B) \neq \{c,d,e,f,g,h\}$ |
| 10 | 2 | 2.4 | 3 | 20 |
| 11 | 2 | 2.4 | 10 | a. 8, b. 78, c. 67, d. 40 |
| 12 | 2 | 2.4 | 14 | a.80, b.160, c.120, d.215, e.60 |
| 13 | 2 | 2.4 | 21 | a. 120, b. 80, c. 50 |
| 14 | 2 | 2.4 | 25 | a. 73, b. 55, c. 91, d. 38, e. 5 |
| 15 | 3 | 3.1 | 24 | Ricky does not love Lucy and Lucy does not love Ricky. |
| 16 | 3 | 3.1 | 37 | All basketball players are 6 ft tall |
| 17 | 3 | 3.1 | 39 | He is not bald and he does not have a 10-in. forehead. |
| 18 | 3 | 3.2 | 9 | $g \wedge s$ |
| 19 | 3 | 3.2 | 11 | a. $p \wedge q$, b. $p \vee q$, c. Statement (a) false, (b) true |
| 20 | 3 | 3.2 | 23 | $q \vee \sim j$, false |
| 21 | 3 | 3.2 | 31 | Diagram Below |
| 22 | 3 | 3.2 | 45 | Diagram Below |
| 23 | 3 | 3.3 | 15 | Diagram Below |
| 24 | 3 | 3.3 | 17 | Diagram Below |
| 25 | 3 | 3.3 | 25 | $q \rightarrow \sim p$ |
| 26 | 3 | 3.3 | 55 | Statement (d) |
| 27 | 3 | 3.4 | 19 | $u \rightarrow h$ |
| 28 | 3 | 3.5 | 7 | Valid, Diagram Below |
| 29 | 3 | 3.5 | 15 | Invalid, Diagram Below |
| 30 | 3 | 3.6 | 6 | $u \rightarrow s$ $s \rightarrow t$ $\therefore u \rightarrow t$ Valid |
| 31 | 3 | 3.6 | 41 | Conclusion (c) |
| 32 | 8 | 8.2 | 13 | Trapezoid |
| 33 | 8 | 8.2 | 19 | Scalene, Acute |
| 34 | 8 | 8.2 | 25 | (a) and (c) |
| 35 | 8 | 8.2 | 29 | 14 |
| 36 | 8 | 8.2 | 37 | 18.75 ft |
| 37 | 8 | 8.3 | 14 | 53 yd |
| 38 | 8 | 8.3 | 17 | $7\pi \approx 22.0$ m |
| 39 | 8 | 8.3 | 31 | $d = 15$ cm, $r = 7.5$ cm |
| 40 | 8 | 8.4 | 4 and 9 | 16 m ² , $800 + 50\pi \approx 957$ cm ² |

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| 41 | 8 | 8.4 | 15 | $(25/4)\pi \approx 19.6$ ft. ² |
| 42 | 8 | 8.4 | 17 | 8 ft. |
| 43 | 8 | 8.4 | 32 | 7 in. |
| 44 | 8 | 8.4 | 39 | a. Its area is multiplied by 4. b. Its area is multiplied by 9. c. Its area is multiplied by k^2 |
| 45 | 8 | 8.5 | 9 | a. The volume is multiplied by 8. b. The volume is multiplied by 27. |
| 46 | 8 | 8.5 | 11 | a. 1600 in. ² , b. 880 in. ² |
| 47 | 8 | 8.5 | 25 | $288\pi \approx 904$ in. ³ |
| 48 | 8 | 8.5 | 36 | a. About 456 in. ³ , b. About 871 in. ³ , c. About 52% |
| 49 | 10 | 10.1 | 16 | a. 17,576, b. 1000, c.17,576,000 |
| 50 | 10 | 10.1 | 19 | a. 900,000,000, b. 10^9 |
| 51 | 10 | 10.2 | 16 | 5 |

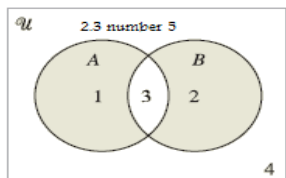
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|----|----|------|----|--------------------------------------------------------------------------------------------------------------------|
| 52 | 10 | 10.2 | 36 | 63 |
| 53 | 10 | 10.2 | 39 | 60 |
| 54 | 10 | 10.2 | 41 | a. $10^6 = 1,000,000$, b. $P(10,6) = 151,200$, c. 151,200 are not enough for the population of 608,827. |
| 55 | 10 | 10.3 | 20 | 190 |
| 56 | 10 | 10.3 | 25 | $C(52,5) = 2,598,960$ |
| 57 | 10 | 10.4 | 11 | a. $C(7,3)C(8,1) = 280$ b. $C(5,3)C(2,1) = 20$ |
| 58 | 11 | 11.1 | 10 | $7/10 = .70$ |
| 59 | 11 | 11.1 | 45 | a. 13/17, b. 4/17 |
| 60 | 11 | 11.1 | 49 | a. 8/75, b. 1/5 |
| 61 | 11 | 11.2 | 10 | $\frac{C(5,1)C(6,1)}{C(11,2)} = 6/11$ |
| 62 | 11 | 11.2 | 11 | $\frac{P(26,2)}{P(52,2)} = 1/221$ |
| 63 | 11 | 11.2 | 22 | a. $C(5,2) = 10$, b. $C(3,2) = 3$ $C(8,2) = 28$ c. $\frac{C(5,1)C(3,1)}{C(8,2)} = 15/28$ |
| 64 | 11 | 11.3 | 3 | 1 |
| 65 | 11 | 11.3 | 13 | $3/13 \approx .231$ |
| 66 | 11 | 11.4 | 9 | a. 1/5, b. 1/3 |
| 67 | 11 | 11.4 | 19 | a. 3/10, b. 39/100 |
| 68 | 11 | 11.5 | 3 | a. 1/96, b. 1/48, c. 7/16 |
| 69 | 11 | 11.5 | 31 | a. 1/12, 1/8 |
| 70 | 11 | 11.6 | 7 | 5 to 21 |
| 71 | 11 | 11.6 | 15 | $3/5 = .60$ |
| 72 | 12 | 12.2 | 14 | 40 |
| 73 | 12 | 12.2 | 15 | a. 0.34, b. \$20,000 - \$24,999 c. \$39,444, d. \$20,000 |

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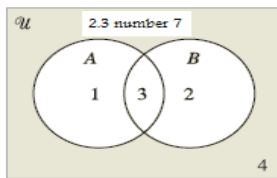
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|---------|---------|-----------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 74 | 12 | 12.2 | 17 | Statements (b) and (c) are true. |
| 75 | 12 | 12.3 | 11 | a. 8, b. 6.5, c. 6, d. 3.23, e. 70% |
| 76 | 12 | 12.3 | 15 | Range 15, Mean 7, Standard Deviation $\sqrt{30} \approx 5.48$ |
| 77 | 12 | 12.3 | 27 | The numbers are all the same. If zero is the standard deviation, then $(x - \bar{x})^2 = 0$ for all x in the set. |
| 78 | 12 | 12.3 | 30 | For the first class, $x + s = 80$, $x + 2s = 85$, so the probability of scores ≥ 90 is very small. For the second class, $x + s = 85$, $x + 2s = 100$, so we would expect several scores ≥ 90 . |
| 79 | 12 | 12.4 | 1 | a. 100 in., b. 10 in., c. 68%, d. 2700 |
| 80 | 12 | 12.4 | 3 | a. 25, b. 25, c. 680 |
| 81 | 12 | 12.4 | 4 | a. 680, b. 25, c. 180 |
| 82 | 12 | 12.4 | 29 | a. 0.249, b. 0.477 |
| 83 | 12 | 12.4 | 31 | a. 0.998, b. 0.004 |
| 84 | 12 | 12.4 | 33 | 0.228 |
| 85 | 12 | 12.4 | 44 | 95% between 90 and 130 gal., 99% between 80 and 140 gal. |
| 86 | 12 | 12.5 | 39 | Diagram Below |
| 87 | 12 | 12.5 | 41 | Diagram Below |
| 88 | 12 | 12.6 | 24 | $9/50 \times 200 = 36$ males and $19/50 \times 200 = 76$ females |
| 89 | 12 | 12.6 | 28 | a. Diagram Below, b. 8.5%, c. 425 |
| 90 | 12 | 12.7 | 15 | (c) |
| 91 | 12 | 12.7 | 17 | (a) |
| 92 | 12 | 12.7 | 18 | (a) |

Diagram Answers

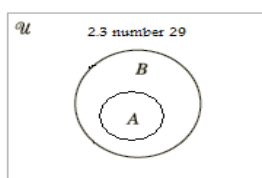
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6



8



21

| 1 | 5 | 4 | 3 |
|-----|--------|--------------|----------|
| p | \sim | $(p \vee q)$ | $\sim q$ |
| T | F | T | F |
| T | F | T | T |
| F | T | F | F |
| F | F | T | T |

22

| 1 | 2 | 4 | 3 | 5 | 7 | 6 |
|-----|-----|--------|--------------|----------|----------|----------|
| p | q | \sim | $(p \vee q)$ | $\sim p$ | \wedge | $\sim q$ |
| T | T | F | T | F | F | F |
| T | F | F | T | F | F | T |
| F | T | F | T | T | F | F |
| F | F | T | F | T | T | T |

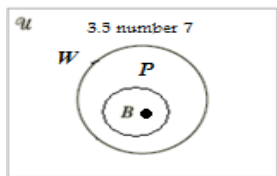
23

| 1 | 3 | 4 | 6 | 5 |
|-----|-----|---------------------|-------------------|--------------|
| p | r | $(p \rightarrow q)$ | \Leftrightarrow | $(p \vee r)$ |
| T | T | T | T | T |
| T | F | T | T | T |
| T | T | F | F | T |
| T | F | F | F | T |
| F | T | T | T | T |
| F | F | T | F | F |
| F | T | T | T | T |
| F | F | T | F | F |

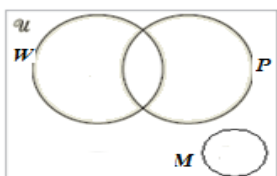
24

| 1 | 2 | 3 | 5 | 4 |
|-----|-----|-----|-----------------|----------------|
| p | q | r | $p \rightarrow$ | $(q \wedge r)$ |
| T | T | T | T | T |
| T | T | F | F | F |
| T | F | T | F | F |
| T | F | F | F | F |
| F | T | T | T | T |
| F | T | F | T | F |
| F | F | T | T | F |
| F | F | F | T | F |

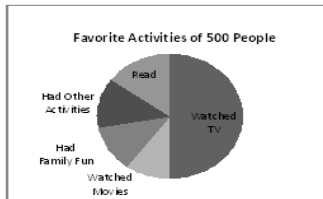
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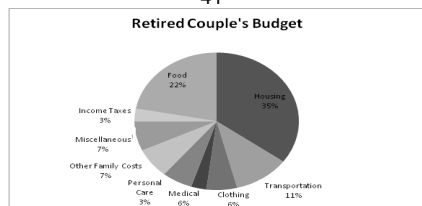
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41



89a

