

## CHAPTER 1

### Unit 1A Quick Quiz

1. a 2. c 3. b 4. a 5. b 6. b 7. b 8. c 9. b 10. a

### Unit 1A Exercises

5. Does not make sense  
6. Does not make sense  
7. Makes sense  
8. Makes sense  
9. Does not make sense  
10. Makes sense

11. a. *Premise:* Apples iPhones outsell all other smart phones.  
*Conclusion:* They must be the best smart phone on the market.  
b. The fact that many people buy iPhones does not necessarily mean they are the best smart phones.  
12. a. *Premise:* I became sick soon after eating at Burger Hut.  
*Conclusion:* Burger Hut food made me sick.  
b. The argument doesn't prove that Burger Hut food was the cause of the sickness.

13. a. *Premise:* Decades of searching have not revealed life on other planets. *Conclusion:* Life in the universe must be confined to Earth.  
b. Failure to find life on other planets does not imply that life does not exist elsewhere in the universe.

14. a. *Premise:* I saw three people use food stamps to buy expensive steaks. *Conclusion:* Abuse of food stamps is widespread.  
b. Three instances do not establish a claim about widespread use.  
15. a. *Premise:* He refused to testify by invoking his Fifth Amendment rights. *Conclusion:* He must be guilty.  
b. The conclusion is stated as if it were the only possible conclusion.

16. a. *Premise:* Thousands of unarmed people, many of them children, are killed by firearms every year. *Conclusion:* The sale of all guns should be banned.  
b. The conclusion is reached on the basis of an emotional statement.

17. a. *Premise:* Senator Smith has accepted contributions from companies that sell genetically modified crop seeds. *Conclusion:* Senator Smith's bill on agricultural policy is a sham.  
b. A claim about Senator Smith's personal behavior is used to criticize his bill.

18. a. *Premise:* It's illegal to drive faster than the speed limit and breaking the law makes you a criminal. *Conclusion:* Drivers who exceed the speed limit are criminals.  
b. The conclusion is a restatement of the premise.

19. a. *Premise:* Good grades are needed to get into college, and a college diploma is necessary for a successful career. *Conclusion:* Attendance should count in high school grades.  
b. The premise (which is often true) directs attention away from the conclusion.

20. a. *Premise:* The mayor wants to raise taxes to fund social programs. *Conclusion:* She must not believe in the value of hard work.  
b. The mayor is characterized (perhaps wrongly) in the conclusion as lacking a belief in hard work based on her position on an unrelated issue.

21. False  
22. True  
23. False  
24. True

25. *Premise:* A nightmare followed eating oysters for dinner. *Conclusion:* Oysters cause nightmares. False cause  
26. *Premise:* Chinese restaurants in America outnumber McDonald's by nearly three to one. *Conclusion:* Chinese food is preferable to hamburgers. Appeal to popularity  
27. *Premise:* All the nurses in a particular hospital are women. *Conclusion:* Women are better qualified for medical jobs.

28. *Premise:* The governor wants to sell public lands to an energy exploration company. *Premise:* He is an untrustworthy opportunist. *Conclusion:* I oppose the land sale. Personal attack  
29. *Premise:* My uncle never drank alcohol and lived to be 93. *Conclusion:* Avoiding alcohol leads to greater longevity.

30. *Premise:* The state has no right to take a life. *Conclusion:* The death penalty should be abolished. Circular reasoning  
31. *Premise:* Five hundred million copies of Don Quixote have been sold. *Conclusion:* Don Quixote is popular. Appeal to popularity  
32. *Premise:* I live near an oil well and have never felt an earthquake. *Conclusion:* Claims that fracking causes earthquakes are ridiculous. Appeal to ignorance

33. *Premise:* An audit of the last charity I gave to showed that most of the money was used to pay administrators in the front office. *Conclusion:* Charities cannot be trusted. Hasty generalization  
34. *Premise:* Prison overcrowding is a crisis. *Conclusion:* Capital punishment must be used to reduce the overcrowding. Limited choice

35. *Premise:* The senator is a member of the National Rifle Association. *Conclusion:* I'm sure she opposes a ban on large-capacity magazines. Straw man  
36. *Premise:* Wider highways can relieve traffic congestion. *Conclusion:* We should build wider highways to benefit the tourist industry. Diversion

37. *Premise:* Some Democrats support doubling the federal minimum wage. *Conclusion:* Democrats think that everyone should have the same income. Straw man  
38. *Premise:* The giant sea squid has never been observed in its habitat. *Conclusion:* It must be extinct in the wild. Appeal to ignorance

39. Premise: My little boy loves dolls and my little girl loves trucks. Conclusion: It's not true that little boys are more interested in mechanical toys and girls prefer maternal toys. Appeal to ignorance or hasty generalization
40. Premise: Some Republicans want to deregulate oil and gas exploration. Conclusion: Republicans don't think that government can improve society. Straw man
41. The example shows the fallacy of division because the fact that Jake is an American does not mean that he acts the same as all other Americans.
42. The example shows the gambler's fallacy because it uses the fact that one type of weather occurred on previous consecutive days to draw a conclusion about the next day's weather.
43. The example shows the fallacy of slippery slope because it assumes that the fact that troops have been sent to three countries means it's inevitable that they'll be sent to more.
44. The example shows the middle ground fallacy because it assumes that the best policy must be in between the two positions advocated by the senators.

## Unit 1B Quick Quiz

1. c 2. a 3. c 4. c 5. c 6. a 7. b 8. c 9. b 10. a

## Unit 1B Exercises

7. Does not make sense  
9. Makes sense  
11. Does not make sense  
13. Proposition  
15. Not a proposition  
16. Proposition  
18. Proposition  
19. The negation is Asia is not in the northern hemisphere. The original proposition is true; the negation is false.  
20. The negation is Peru is not in the northern hemisphere. The original proposition is false; the negation is true.  
21. The negation is *The Beatles* were a German band. The original proposition is true; the negation is false.  
22. The negation is *Earth is not the center of the universe*. The original proposition is false; the negation is true.  
23. Sarah did go to dinner.  
24. The mayor approves of allowing the rallies.  
25. Taxes will not be lowered.  
26. Logging will continue.  
27. Sue wants new trees planted in the park.  
28. The senator does not support the bill.

q	r	q and r
T	T	T
F	T	F
T	F	F
F	F	F
p	s	p and s
T	T	T
F	T	F
T	F	F
F	F	F

p	r	p or r
T	T	T
F	T	T
T	F	T
F	F	F
r	s	r or s
T	T	T
F	T	T
T	F	T
F	F	F

39. Exclusive  
41. Exclusive  
42. Exclusive (whichever comes first)  
43. Inclusive  
44. Inclusive

p	q	r	s	p and q and r and s
T	T	T	T	T
T	T	T	F	F
T	T	F	T	F
T	T	F	F	F
T	F	T	T	F
T	F	T	F	F
T	F	F	T	F
T	F	F	F	F
F	T	T	T	F
F	T	T	F	F
F	T	F	T	F
F	T	F	F	F
F	F	T	T	F
F	F	T	F	F
F	F	F	T	F
F	F	F	F	F

q	r	s	q and r and s
T	T	T	T
T	T	F	F
T	F	T	F
T	F	F	F
F	T	T	F
F	T	F	F
F	F	T	F
F	F	F	F

37. q r s q and r and s
38. p q r s p and q and r and s
39. Exclusive  
41. Exclusive  
42. Exclusive (whichever comes first)  
43. Inclusive  
44. Inclusive
31. p = dogs are animals, q = oak trees are plants. Both propositions are true, so the conjunction is true.  
32. The first proposition ( $12 + 6 = 18$ ) is true, and the second proposition ( $3 \times 5 = 8$ ) is false, so the conjunction is false.  
33. p = Venus is a planet, q = the Sun is a star. Both propositions are true, so the conjunction is true.  
34. p = Emily Dickinson was a poet, q = Kanye West is a Major League pitcher. The second proposition is false, so the conjunction is false.  
35. p = all birds can fly, q = some fish live in trees. Both propositions are false, so the conjunction is false.  
36. p = not all men are tall, q = not all women are short. Both propositions are true, so the conjunction is true.

61. *Hypothesis:* Paris is in France. *Conclusion:* New York is in China. The hypothesis is true, the conclusion is false, and the conditional proposition is false.
62. *Hypothesis:* Paris is in Mongolia. *Conclusion:* New York is in America. The hypothesis is false, the conclusion is true, and the conditional proposition is true.
63. *Hypothesis:* Trees can walk. *Conclusion:* Birds wear wigs. The hypothesis is false, the conclusion is false, and the conditional proposition is true.
64. *Hypothesis:*  $2 \times 3 = 6$ . *Conclusion:*  $2 + 3 = 6$ . The hypothesis is true, the conclusion is false, and the conditional proposition is false.
65. *Hypothesis:* Dogs can swim. *Conclusion:* Dogs are fish. The hypothesis is true, the conclusion is false, and the conditional proposition is false.
66. *Hypothesis:* Dogs are fish. *Conclusion:* Dogs can swim. The hypothesis is false, the conclusion is true, and the conditional proposition is true.
67. If it snows, then I get cold.
68. If a person lives in Boston, then that person lives in Massachusetts.
69. If you are breathing, then you are alive.
70. If you are alive, then you are breathing.
71. If you are pregnant, then you are a woman.
72. If you are a woman, then you are pregnant.
73. *Converse:* If Tara owns a car, then she owns a Cadillac.
- Inverse:* If Tara does not own a Cadillac, then she does not own a car. *Contrapositive:* If Tara does not own a car, then she does not own a Cadillac. The original proposition and the contrapositive are equivalent. The converse and inverse are equivalent.
74. *Converse:* If the patient is breathing, then the patient is alive. *Inverse:* If the patient is not alive, then the patient is not breathing. *Contrapositive:* If the patient is not breathing, then the patient is not alive. The original proposition and the contrapositive are equivalent. The converse and inverse are equivalent.
75. *Converse:* If Helen is a U.S. citizen, then she is the U.S. President. *Inverse:* If Helen is not the U.S. President, then she is not a U.S. citizen. *Contrapositive:* If Helen is not a U.S. citizen, then she is not the U.S. President. The original proposition and the contrapositive are equivalent. The converse and inverse are equivalent.
76. *Converse:* If the lights are on, then I am using electricity. *Inverse:* If I am not using electricity, then the lights are not on. *Contrapositive:* If the lights are not on, then I am not using electricity. The original proposition and the contrapositive are equivalent. The converse and inverse are equivalent.
77. *Converse:* If there is gas in the tank, then the engine is running. *Inverse:* If the engine is not running, then there is no gas in the tank. *Contrapositive:* If there is no gas in the tank, then the engine is not running. The original proposition and the contrapositive are equivalent. The converse and inverse are equivalent.
78. *Converse:* If the oceans rise, then the polar ice caps will have melted. *Inverse:* If the polar ice caps do not melt, then the oceans will not rise. *Contrapositive:* If the oceans do not rise, then the polar ice caps will not have melted. The original

47. 

p	not p	p and (not p)
T	F	F
F	T	F
48. 

q	not q	q or (not q)
T	F	T
F	T	T
49. 

p	q	r	p or q or r
T	T	T	T
T	T	F	T
T	F	T	T
T	F	F	T
F	T	T	T
F	T	F	F
F	F	T	F
F	F	F	F
50. 

p	not p	q	p or (not p) or q
T	F	T	T
T	F	F	T
F	T	T	T
F	T	F	T
51.  $p = \text{elephants are animals}$ ,  $q = \text{elephants are plants}$ . Proposition  $p$  is true and  $q$  is false, so the disjunction ( $p$  or  $q$ ) is true.
52.  $p = \text{the Nile River is in Europe}$ ,  $q = \text{the Ganges River is in Asia}$ . Proposition  $p$  is false and  $q$  is true, so the disjunction ( $p$  or  $q$ ) is true.
53.  $p = 3 \times 5 = 15$ ,  $q = 3 + 5 = 8$ . Both propositions are true, so the disjunction  $p$  or  $q$  is true.
54.  $p = 2 + 2 = 5$ ,  $q = 3 + 3 = 7$ . Both propositions are false, so the disjunction  $p$  or  $q$  is false.
55.  $p = \text{cars swim}$ ,  $q = \text{dolphins fly}$ . Neither proposition is true, so the disjunction  $p$  or  $q$  is false.
56.  $p = \text{oranges are round}$ ,  $q = \text{bananas are round}$ . Proposition  $p$  is true and proposition  $q$  is false, so the disjunction  $p$  or  $q$  is true.
57. 

p	r	if p, then r
T	T	T
T	F	F
F	T	T
F	F	T
58. 

q	s	if q, then s
T	T	T
T	F	F
F	T	T
F	F	T
59. *Hypothesis:* Trout can swim. *Conclusion:* Trout are fish. Both propositions are true, and the conditional proposition (implication) is true.
60. *Hypothesis:* Paris is in France. *Conclusion:* New York is in America. Both propositions are true, and the conditional proposition (implication) is true.

proposition and the contrapositive are equivalent. The

converse and inverse are equivalent.

79. If you don't have passion, then you don't have energy. If you

don't have energy, then you have nothing.

80. If we wait for some other person or some other time, then

change will not come.

81. If you are excellent at flipping fries at McDonald's, then

everyone will want to be in your line.

82. If I have six hours to chop down a tree, then I will spend the

first four sharpening the axe.

83. If Sue lives in Cleveland, then she lives in Ohio. (When, in

fact, Sue lives in Cincinnati.)

84. If  $2 + 2 = 4$ , then  $3 + 3 = 6$ .

85. If Ramon lives in Albuquerque, then he lives in

New Mexico.

86. If Delaware is in America, then Maryland is in Canada.

87. If it is a fruit, then it is an apple.

88. (1) If the payer did not know you had remarried, then

alimony you receive after you remarried is taxable. (2) If the

payer did know you had remarried, then alimony you receive

after you remarried is not taxable. (3) If you pay alimony, then

you may never deduct it.

89. (a) Believing is sufficient for achieving.

(b) Achieving is necessary for believing.

90. (a) Having your hands in your pockets is a sufficient reason

for failing to climb the ladder of success.

(b) Failing to climb the ladder of success is a necessary result

of having your hands in your pockets.

91. (a) Having six children is sufficient for being committed.

(b) Being committed is necessary for having six

children.

92. (a) Needing both of your hands for whatever it is you're

doing is sufficient for having your brain be in on it too.

(b) Your brain being in on it too is necessary when you need

both of your hands for whatever it is you're doing.

93.	p	q	p and q	not (p and q)	(not p) or (not q)
	T	T	T	F	F
	T	F	F	T	T
	F	T	F	T	T
	F	F	F	T	T

The statements are equivalent.

94.	p	q	p or q	not (p or q)	(not p) and (not q)
	T	T	T	F	F
	T	F	T	F	F
	F	T	T	F	F
	F	F	F	T	T

The statements are equivalent.

95.	p	q	p and q	not (p and q)	(not p) and (not q)
	T	T	T	F	F
	T	F	F	T	F
	F	T	F	T	F
	F	F	F	T	T

The statements are not equivalent.

## Unit 1C Exercises

### Unit 1C Quick Quiz

1. b
2. c
3. a
4. b
5. a
6. c
7. a
8. c
9. a
10. c

96. The statements are equivalent.

96.	p	q	p or q	not (p or q)	(not p) or (not q)
	T	T	T	F	F
	T	F	T	F	T
	F	T	T	F	T
	F	F	F	T	T

The statements are not equivalent.

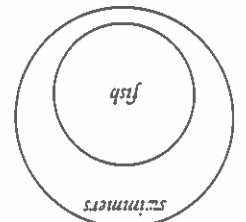
97.	p	q	p and q	(p and q) or r	p or r	q or r	(p or r) and (q or r)
	T	T	T	T	T	T	T
	T	F	F	F	T	F	F
	F	T	F	F	T	T	T
	F	F	F	F	F	F	F

The statements are not equivalent.

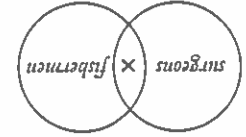
98.	p	q	r	(p or q) and r	p and r	q and r	(p and r) or (q and r)
	T	T	T	T	T	T	T
	T	T	F	F	T	F	F
	T	F	T	F	F	T	F
	T	F	F	F	F	F	F
	F	T	T	F	T	T	T
	F	T	F	F	F	F	F
	F	F	T	F	F	T	F
	F	F	F	F	F	F	F

99. Given the conditional proposition if p, then q, the contrapositive is if not q, then not p. The converse is if q, then p, and the inverse of the converse is if not q, then not p, which is also the contrapositive. Similarly, the contrapositive is the converse of the inverse.

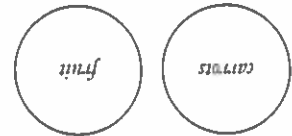
8. Does not make sense
10. Makes sense
12. Makes sense
14. Integers
16. rational numbers
18. whole numbers
20. real numbers
22. real numbers
24. rational numbers
26. rational numbers
28. natural numbers
30. {23, 25, 27, 29, 31, 33, 35}
31. {Louisiana, Arkansas, Tennessee, Alabama}
32. {6, 9, 12, 15, 18, 21, 24}
33. {16, 25, 36}
35. {6, 12, 18, 24, 30}
36. {a, c, i, o, u}



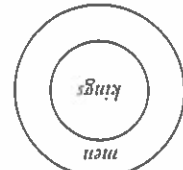
48. a. All fish are swimmers.  
b. Subject: S = fish. Predicate: P = swimmers.  
c.  
d. No



47. a.  
b. Subject: S = surgeons. Predicate: P = fishermen.  
c.  
d. No



46. a.  
b. Subject: S = carrots. Predicate: P = fruit.  
c.  
d. No



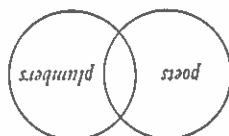
45. a.  
b. Subject: S = kings. Predicate: P = men.  
c.  
d. No



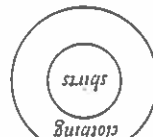
44.



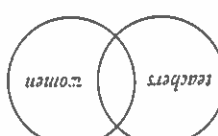
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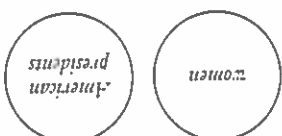
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39.



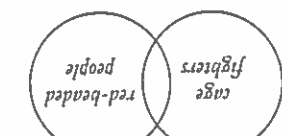
37.



42.



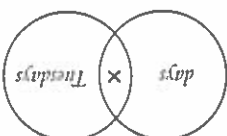
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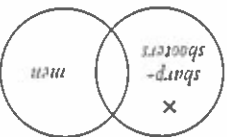
38.



49. a. No monks are sweaters.  
b. Subject: S = monks. Predicate: P = sweaters.  
c.  
d. No



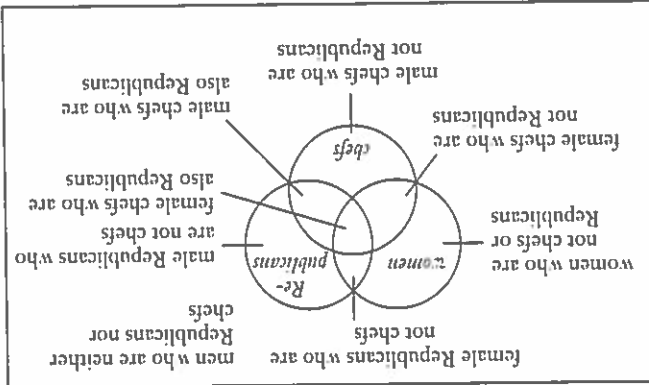
50. a.  
b. Subject: S = days. Predicate: P = Tuesdays.  
c.  
d. No



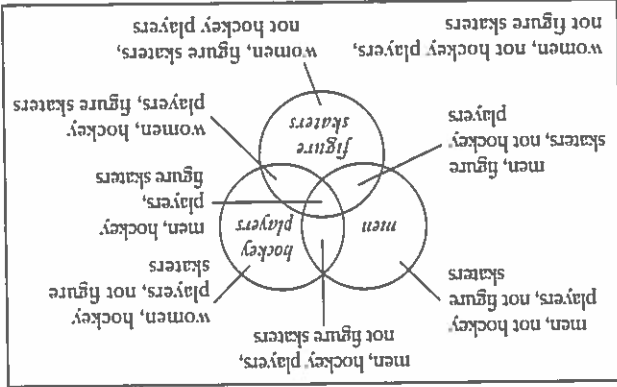
51. a.  
b. Subject: S = sharpshooters. Predicate: P = men.  
c.  
d. No



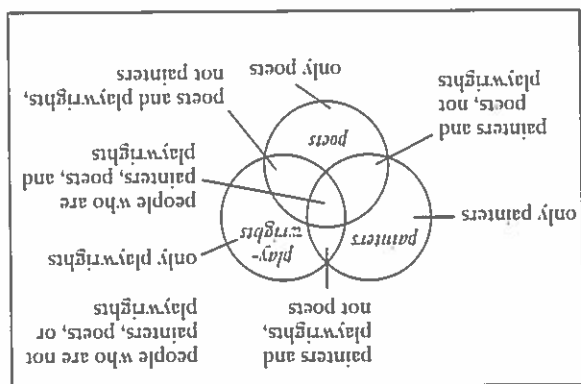
52. a.  
b. Subject: S = shortstops. Predicate: P = blonds.  
c.  
d. No



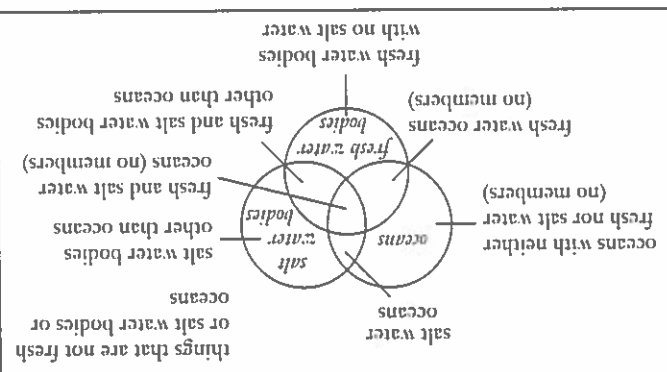
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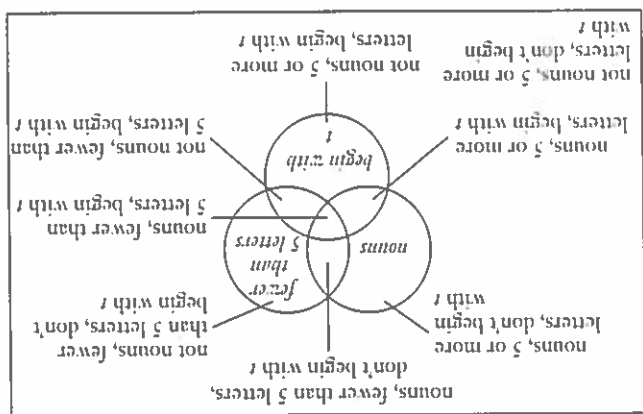
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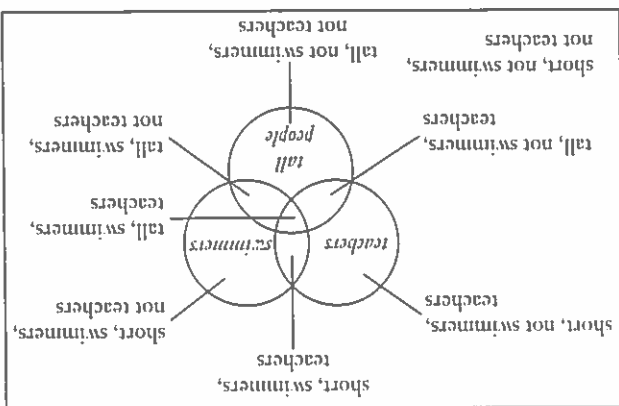
55.



56.



57.

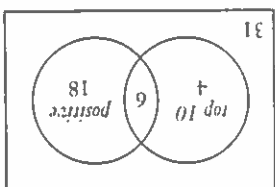


58.

69. a.

Country	Blues	Nashville	San Francisco
35	16	30	19

b.

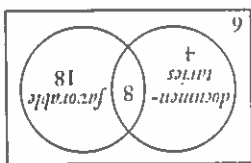


c. 31 d. 59

68. a.

Not top 10	Top 10	Positive	Negative
4	6	18	31

b.

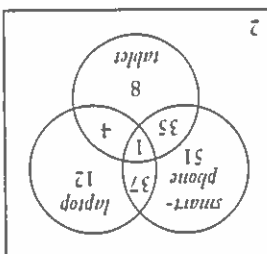


c. 4 d. 18

67. a.

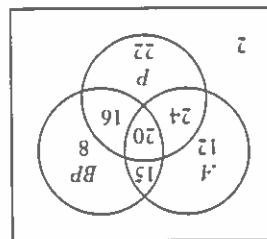
Unfavorable	Favorable	Documentaries	Feature films
4	8	18	6

66. a.



b. 124 c. 97 d. 37  
e. 76 f. 100

65. a.



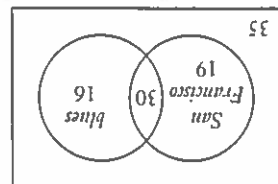
b. 105 c. 24 d. 59  
e. 22 f. 55

60.

Men	Women	White	Black
132	182	52%	4%
18	18	62%	13%
Left-handed	Right-handed	Women	Men

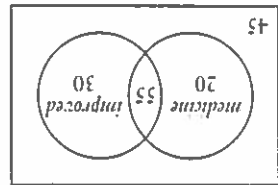
59.

61. a. 31 b. 28 c. 37 d. 81  
62. a. 22 b. 44 c. 16 d. 50  
63. a. 16 b. 24 c. 8 d. 43  
64. a. 11 b. 22 c. 3 d. 77

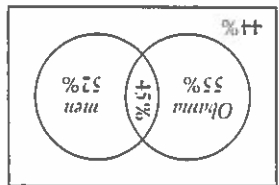


b. c. 16 d. 46

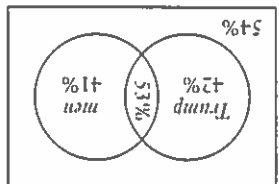
Medicine	Placebo	Improved	Did not improve
35	30	55	20
Total		85	40



b. c. 20 d. 30



71.



72.

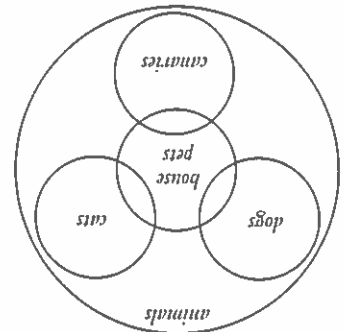
Polygraph: lie	Polygraph: no lie	Total
15	32	47
42	9	51
Total		98

73. a.

Texicd while driving	Did not text while driving	Total
1737	1945	3682
2048	2775	4823
Total		8505

74. a.

b. 75.5% c. 24.5%



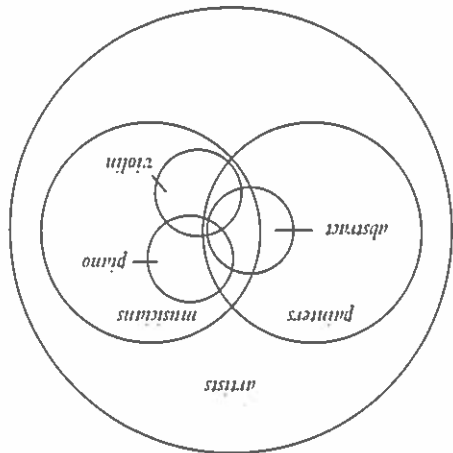
75.

b. 20.4% c. 24.1%

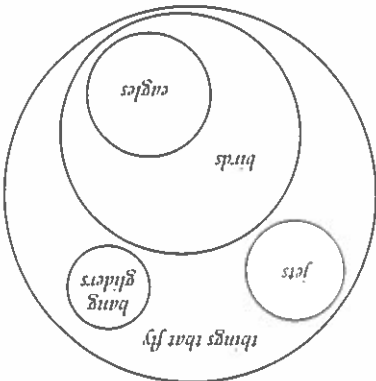
### Unit 1D Exercises

1. b 2. c 3. c 4. a 5. c 6. b 7. c 8. c 9. b 10. b

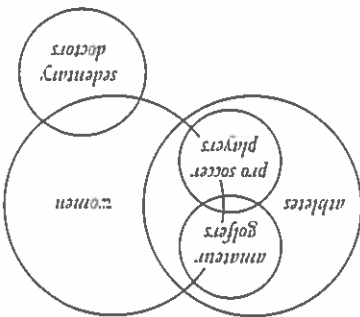
### Unit 1D Quick Quiz



78.



77.



76.

10. Makes sense
11. Makes sense
12. Does not make sense
13. Does not make sense
14. Makes sense
15. Inductive
16. Deductive
17. Inductive
18. Inductive
19. Deductive
20. Deductive
21. Deductive
22. Inductive
23. Premise is true; argument is weak; conclusion is false.
24. Premises are generally true; argument is weak; conclusion may not be true.
25. Premises are true; argument seems moderately strong; conclusion is false.

26. Premises are true; argument seems moderately strong;

conclusion is true.

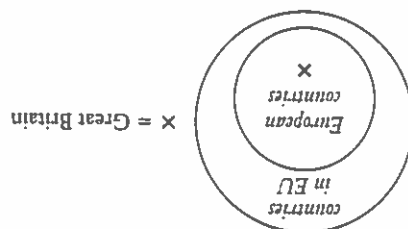
27. Premises are true; argument is moderately strong; conclusion

is true.

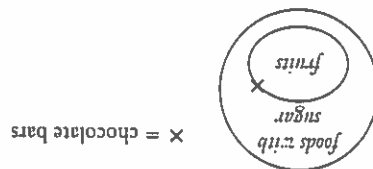
28. Premises are true; argument is moderately strong; conclusion

is true.

29. a. Valid

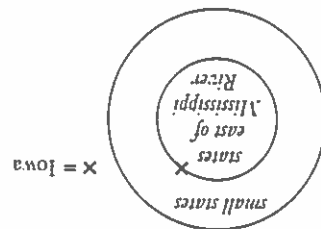


b. The first premise is false, so the argument is not sound.



b. The premises are true, but the argument is not sound.

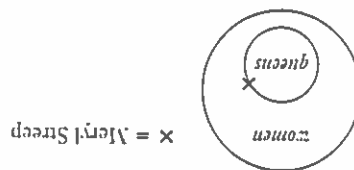
31. a. Not valid



b. The premises are questionable, but the argument is not

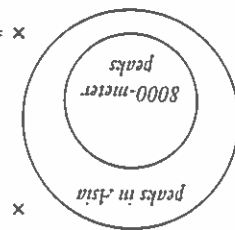
valid so it is not sound.

32. a. Not valid



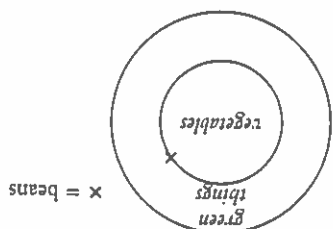
b. The premises are true, but the argument is not sound.

33. a. Valid



b. The premises are true, and the argument is sound.

34. a. Not valid



b. The first premise is not true, and the argument is not

sound.

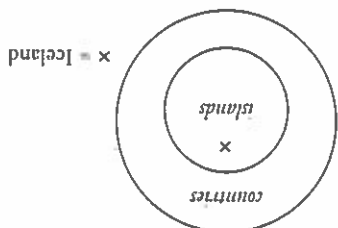
35. a. Not valid



b. Even if the first premise is true, the argument is not valid

and not sound.

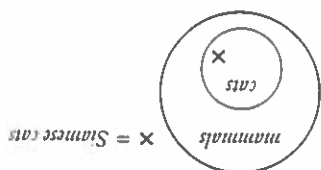
36. a. Valid



b. The first premise is not true, so the argument is not

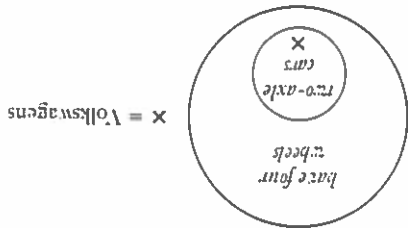
sound.

37. a. Affirming the hypothesis; valid



b. The premises are true, and the argument is sound

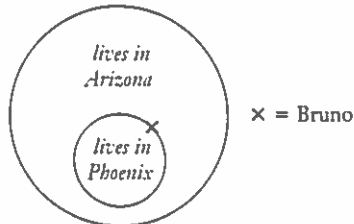
38. a. Affirming the hypothesis; valid



b. The premises are true, and the argument is sound.

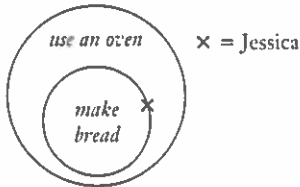


39. a. Affirming the conclusion; not valid



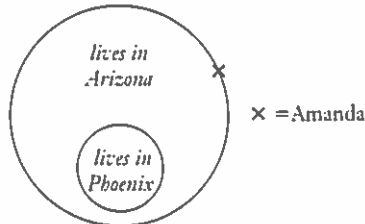
- b. The argument is not sound.

40. a. Affirming the conclusion; not valid



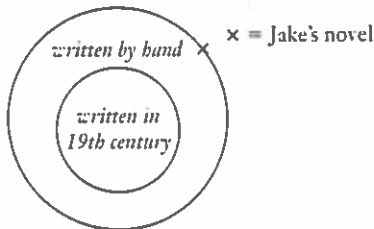
- b. The argument is not sound.

41. a. Denying the hypothesis; not valid



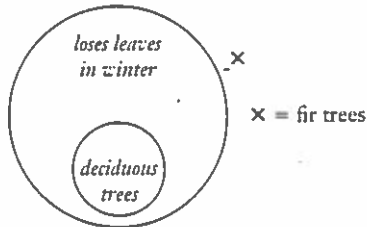
- b. The argument is not sound.

42. a. Denying the hypothesis; not valid



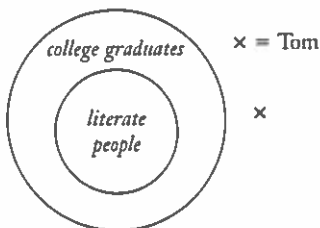
- b. The argument is not sound.

43. a. Denying the conclusion; valid



- b. The premises are true, and the argument is sound.

44. a. Denying the conclusion; valid



- b. The first premise is false, so the argument is not sound.

45.  $p$  = a natural number is divisible by 18,  $q$  = a natural number is divisible by 9,  $r$  = a natural number is divisible by 3. Valid

46.  $p$  = taxes are increased,  $q$  = taxpayers will have less disposable income,  $r$  = the economy will slow down. Valid

47. Not valid

48. Valid

49. True

50. Not true

51. Not true

52. True

53. Example of valid and sound argument:

Premise: All living mammals breathe.

Premise: All monkeys are mammals.

Conclusion: All living monkeys breathe.

54. A sound argument must be valid, so this combination is impossible.

55. Example of valid argument that is not sound:

Premise: All mammals fly. (false)

Premise: All monkeys are mammals. (true)

Conclusion: All monkeys fly. (false)

56. Example of valid argument with false premises and a true conclusion:

Premise: All mammals swim. (false)

Premise: All fish are mammals. (false)

Conclusion: All fish swim. (true)

57. Example of argument that is not valid with true premises and conclusion:

Premise: All mammals breathe. (true)

Premise: All mammals have hair. (true)

Conclusion: All hairy animals breathe. (true)

58. Example of valid argument with false premises and false conclusion:

Premise: All men are bald. (false)

Premise: All nurses are men. (false)

Conclusion: All nurses are bald. (false)

59. Example of affirming the hypothesis (valid):

Premise: If I am in Phoenix, then I am in Arizona.

Premise: I am in Phoenix.

Conclusion: I am in Arizona.

60. Example of affirming the conclusion (not valid):

Premise: If I am in Phoenix, then I am in Arizona.

Premise: I am in Arizona.

Conclusion: I am in Phoenix.

61. Example of denying the hypothesis (not valid):

Premise: If I am in Phoenix, then I am in Arizona.

Premise: I am not in Phoenix.

Conclusion: I am not in Arizona.

62. Example of denying the conclusion (valid):

Premise: If I am in Phoenix, then I am in Arizona.

Premise: I am not in Arizona.

Conclusion: I am not in Phoenix.

63. a. We will sacrifice both free enterprise and security.

- b. We did not insist too adamantly on protecting our privacy.

- c. No conclusion

64. a. They had to break from their cultural norms.

- b. They did not want to be as strong as the West.

- c. No conclusion

65. a. Apes act as if they don't understand the problem at hand.

- b. The usual procedures were followed.

- c. No conclusion

66. a. We would not be able to invent it.

- b. The Burgess Shale would exist.

- c. No conclusion

## Unit 1E Quick Quiz

1. b 2. b 3. c 4. a 5. c 6. b 7. c 8. a 9. b 10. c

## Unit 1E Exercises

5. Makes sense
- 
7. Does not make sense
- 
8. Does not make sense
- 
10. Does not make sense
- 
11. A "yes" vote is a vote against gay rights, while a "no" vote is a vote for gay rights.
- 
12. a. 12 b. 8
- 
- c. An eight-year wait is not required.
- 
- d. Three more consecutive terms are possible. The charter is not clear.
- 
13. a. Yes, if it has not expired and has a picture.
- 
- b. No, it doesn't have a picture.
- 
- c. Apply for a voter identification card or sign a sworn statement and cast a provisional ballot.
- 
- d. The initiative does not explain how to get a voter identification card.
- 
14. a. The words "ensure that consumers who do not choose to install solar are not required to subsidize the costs of ... those who do" essentially mean that those who install solar can be expected to pay fees for backup power and access to the grid.
- 
- b. The sentence may have been included in order to make the amendment sound better to supporters of solar energy.
- 
- c. Answers will vary.
- 
- 15.
- Hidden assumptions:**
- Buying a house will continue to be a good investment. You will spend less out-of-pocket on your mortgage payments than you would on rent.
- 
- 16.
- Hidden assumptions:**
- The money you give is spent on worthwhile causes and not on overhead. United Way does not support unworthy causes.
- 
- 17.
- Hidden assumptions:**
- The governor will keep his promise on tax cuts. You consider tax cuts to be more important than other issues.
- 
- 18.
- Hidden assumptions:**
- A better-funded military means a stronger America. More military spending will mean a better military.
- 
19. The speaker may have a fundamental ideological opposition to paying taxes.
- 
20. The speaker may work for the meat industry.
- 
21. Option A costs \$2200 if you go and \$0 if you cancel. Option B costs \$1200 if you go and \$300 if you cancel. Option A costs \$1000 more if you go. Option B costs \$300 more if you cancel. If the likelihood of cancellation is low, then Option B is better, but if the likelihood of cancellation is high, then Option A is better.
- 
22. a. You probably pay for service and insurance with either option.
- 
- b. Yes; the total cost of the car at the end of the lease is \$18,640.
- 
- c. You have years to decide if you want to buy it. You don't need to worry about selling the car. The dealer may offer special servicing prices with a lease.
- 
23. A legitimate sweptstakes would not ask you to pay a processing fee in order to claim your prize. Note also that the notice never says that your vacation will be fully paid for. There are many "red flags" that should cause you to delete this message as spam.
- 
24. a. Yes b. Yes c. No

25. Pyramidsologists will use real things, such as the way ancient structures often follow astronomical alignments, to support their belief that ancient people had deep knowledge, then simply assume that much more must be hidden, even though there is no evidence of it.
- 
26. Other conclusions are possible. For example, the United States and the Soviet Union might have avoided war because of economic factors, the emergence of a united Western Europe after World War II, or changes in non-nuclear weaponry. Popes have never taken a position in American politics. Of the two major candidates in 2016, one might question why the pope would support Trump's positions on a variety of issues. Because it spread quickly on social media, this story didn't have a source that could be easily checked. Appearing just weeks before the presidential election, a story as incredible as this one might be suspected of being politically motivated.
- 
29. 4
- 
30. No; if he has a widow, he must be dead.
- 
31. Roosters don't lay eggs.
- 
32. 9 33. 22 34. 21 35. 3
- 
36. The surgeon is the boy's mother.
- 
37. 1, 2, 3, 4
- 
38. One minute and forty seconds is 100 seconds.
- 
39. No 40. Yes
- 
41. The current policy will cost you \$5035 over nine months.
- 
42. The upgrade will cost \$2475 over nine months.
- 
43. Painful with your nephew will involve no labor cost, but you'll lose
- $4 \times \$40 = \$160$
- in wages. If the painter does the job, you'll get the \$160 in wages while paying him
- $6 \times \$30 = \$180$
- , for a net cost to you of \$20. So the painter costs \$20 more, and your decision will depend on whether it's worth \$20 to you to avoid painting yourself.
- 
44. For 24 flights, Airline A (\$7000) costs less than Airline B (\$7800).
- 
45. Assuming your accident record is the same for the next 10 years, the new policy with the lower premium will be less expensive.
- 
46. a. Must file b. Must file c. Needn't file d. Must file
- 
47. a. May claim b. Cannot claim c. May claim
- 
48. a. Yes b. Yes, you must pay within 25 days of the statement closing date.
- 
49. a. New conditions go into effect without user approval.
- 
- b. No, continued use of the software implies a user's acceptance.
- 
- c. New conditions that affect the user could go into effect without the user's knowledge or approval.
- 
- d. How does one distinguish a typographical error from a deliberate attempt to take advantage of users?
- 
50. a. Accepting a campaign contribution from someone you have never met conforms with the law.
- 
- b. Accepting a contribution from a government campaign fund would conform with the law. Accepting money from a CEO who will benefit from a bill you are sponsoring would violate the law.
- 
- 50-55. Answers will vary.

# CHAPTER 2

## Unit 2A Quick Quiz

1. b 2. a 3. b 4. a 5. b 6. c 7. b 8. c 9. a 10. b

## Unit 2A Exercises

7. Does not make sense  
9. Makes sense  
10. Does not make sense  
11. Does not make sense  
12. Does not make sense  
13. a.  $3/8$  b.  $2/5$  c.  $2$  d.  $5/6$  e.  $1/6$  f.  $5/8$  g.  $3/8$  h.  $1$   
14. a.  $8/15$  b.  $10/7$  c.  $5/8$  d.  $23/12$  e.  $22/15$  f.  $6/35$   
15. a.  $7/2$  b.  $3/10$  c.  $1/20$  d.  $41/10$  e.  $43/20$  f.  $7/20$   
16. a.  $11/4$  b.  $9/20$  c.  $1/200$  d.  $29/25$  e.  $13/2$   
17. a.  $0.25$  b.  $0.375$  c.  $0.667$  d.  $0.6$  e.  $6.5$  f.  $3.833$   
18. a.  $0.2$  b.  $0.444$  c.  $0.364$  d.  $1.714$  e.  $3.111$  f.  $5.091$   
19.  $1797.6$  lb  
20.  $1041.7$  mi/hr  
21.  $53.13$   
22.  $242$  oz  
23.  $518.26$ /hr  
24. 11 buses  
25. a. Area =  $240$  ft<sup>2</sup>; volume =  $1920$  ft<sup>3</sup>  
b. Surface area =  $500$  yd<sup>2</sup>; volume =  $1000$  yd<sup>3</sup>  
c. Area =  $180$  ft<sup>2</sup>; volume =  $216$  ft<sup>3</sup>  
d. Area =  $1800$  yd<sup>2</sup>; volume =  $5400$  yd<sup>3</sup>  
e. Area =  $384$  ft<sup>2</sup>; volume =  $3072$  ft<sup>3</sup>  
f. Volume =  $5720$  ft<sup>3</sup>

27. mi/hr; miles per hour 28. \$/mi; dollars per mile  
29. in<sup>3</sup>/sec; cubic inches per second  
30. euros; euros  
31. \$; dollars  
32. bagels  
33. \$28.80  
35. \$3000  
36. \$1977.60  
38.  $108.434$  people/mi<sup>2</sup>  
39. \$2.39  
40. \$1.02 million  
41. Wrong; the student's division gives an answer with units of pounds<sup>2</sup> per dollar, but the answer should be in dollars (or cents). Instead, multiply:  $(0.11 \text{ lb}) \times \frac{52.70}{1 \text{ lb}} = 5.85$   
42. Wrong; the student's division gives an answer with units of mi/hr<sup>2</sup>, but the answer should be in miles. Instead, multiply:  $\frac{2 \text{ mi}}{1 \text{ hr}} \times 3 \text{ hr} = 15 \text{ mi}$   
43. Wrong; the student's division gives an answer with units of pounds per dollar, but the answer should be in dollars (or cents) per pound. Instead, divide dollars by pounds:  $\frac{50 \text{ lb}}{511} = 50.22$ /lb, or 22 cents/pound, which is less than the 39 cents/pound for the smaller bag.  
44. Wrong; the student's multiplication gives an answer with units of Calories<sup>2</sup> per Coke per day, but the answer should be given with units of Cokes per day. Instead, divide:  $\frac{140 \text{ cal/Coke}}{1500 \text{ cal/day}} = 10.7$  Cokes/day, or about 11 Cokes/day  
45. 384 in  
46. 5.33 yd  
47. 2100 s  
49. 15,120 s  
50. 4.78 mi/s  
51. 35,040 hr  
52. 0.72 mi  
53.  $1 \text{ ft}^2 = 144 \text{ in}^2$ ,  $\frac{1 \text{ ft}^2}{144 \text{ in}^2} \cdot \frac{1 \text{ ft}^2}{144 \text{ in}^2}$

## Unit 2B Exercises

8. Does not make sense  
9. Does not make sense  
10. Does not make sense  
11. Does not make sense  
12. Does not make sense  
13. a.  $10^{11}$  b.  $10^2$  c.  $10^4$  d.  $10^{-9}$  e.  $10^{16}$  f.  $10^0 = 1$   
14. a.  $10^{-8}$  b.  $10^2$  c.  $10^{35}$  d.  $10^{-9}$  e.  $10^{10}$  f. 11  
g. 100.1 h. 90  
15. a. 1.25 mi b. 2200 yd  
16. a. 6033 fathoms b. 1.99 leagues  
17. 373.9 lb; 0.19 ton  
18. 272 kg; 1.1 yd<sup>3</sup>  
19. 34.5 mi/hr; 92.517 metric tonnes  
20. 15 mi/hr; 22 ft/s  
21. 6-ounce bottle for \$3.99  
22. 150 pens for \$165  
23. 15-gallon tank for \$35.25  
24. \$30/yd<sup>2</sup> per month  
25.  $10^3$   
26.  $10^9$   
27.  $10^6$   
29.  $10^6$   
30.  $10^6$   
31. 13.7 qt  
32. 11.5 ft  
33. 15.4 kg  
34. 13.8 km  
35. 1.2 mi<sup>2</sup>  
36. 43.5 mi/hr  
37. 21.0 m/s  
38. 12.2 in<sup>3</sup>  
39. 0.8 lb/in<sup>3</sup>  
40. 10.1 km<sup>2</sup>  
41. 0.007 km = 7 m  
42. Approximately 0.167 km = 167 m  
43. a. 7.2°C b. 68.0°F c. 5.0°F d. -22.0°F e. 21.1°C  
44. a. 17.6°F b. -9.4°C c. 59.0°F d. 23.9°C e. -6.7°C  
45. a. -223.15°C b. -33.15°C c. 283.15 K  
46. a. 233.15 K b. 126.85°C c. 398.15 K  
47. 1743 wait  
48. 2324 wait  
49. \$0.16; \$42.71 saved  
50. \$0.56; \$102.20 saved  
51. 0.6 gm/cm<sup>3</sup>; floats  
52. 0.052 g/cm<sup>3</sup>; floats

## Unit 2B Quick Quiz

1. a 2. a 3. b 4. b 5. c 6. a 7. c 8. b 9. c 10. b

## Unit 2B Exercises

79. Answers will vary  
78. a. 8,000,000 pages b. 16,000 books  
77. 4320 L  
76. a. \$387,500 per game b. \$8073 per minute c. \$9688 per hr  
75. a. 25 hr; 20 hr b. \$119.53; \$153.00  
74. a. 36.4 hr; 28.6 hr b. \$134.21; \$159.38  
c. Car A: \$191; car B: \$255  
73. a. Car A: \$30.60 per tank; car B: \$51.00 per tank  
b. Car A: 6.25 tanks; car B: 5 tanks  
72. 62.5 gal; yes  
71. Approximately 2.7 billion heart beats  
70. 2737.5 hr  
69. 7.6 births/min; 12.5 births/1000 people  
67. 79.4 mi/hr  
68. 900.5 ft  
66. \$0.58/lb  
65. \$6.01/gal  
Table 2.1 is used)  
64. \$114.35 (or \$114.36, depending on which column of  
62. \$389.61  
63. \$338.56  
61. \$100.12  
59. 13.0 yd<sup>3</sup>  
58. 11.1 yd<sup>3</sup>  
57.  $1 \text{ m}^3 = 10^6 \text{ cm}^3$ ,  $\frac{1 \text{ m}^3}{10^6 \text{ cm}^3} \cdot \frac{1 \text{ m}^3}{10^6 \text{ cm}^3}$   
56. 54,000 ft<sup>2</sup>  
54. 2160 ft<sup>2</sup>  
55. 152,460 ft<sup>2</sup>