Question 7a

a. True
b. False
c. True
d. False
e. True
f. False
g. False

Question 7b

a. False
b. True
c. True
d. True
e. False

Question 7c

b. { x ∈ **Z**: x modulo 3 = 0 }; the set is infinite.
d. { x ∈ **Z**: x modulo 10 = 0 }; the cardinality is 101.

Question 7d

a. True
b. True
c. False
d. False
e. True
f. True
g. True
h. False
i. False
j. False
k. False

Question 8a

b. Let A = {1, 2, 3}. What is $\{X \in P(A): 2 \in X\}$?
   $P(A) = \{\emptyset, \{1\},\{2\},\{3\},\{1,2\},\{1,3\},\{2,3\},\{1,2,3\}\}$
   therefore $\{X \in P(A): 2 \in X\} = \{\{2\},\{1,2\},\{2,3\},\{1,2,3\}\}$

Question 9a

c. {-3,1,17}
d. {-5,-3, 0, 1, 4, 17}
e. {1}

Question 9b

a. {1}
b. {1,2,3,4,5,9,16,25}
e. { x ∈ **R**: -1/100 <= x <= 1/100 }
f. { x ∈ **R**: -1 <= x <= 1 }

Question 9c

b. {Ø, {a},{b},{c},{a,b},{a,c},{b,c},{a,b,c}}
d. {Ø, {a},{b},{c},{a,b},{a,c},{b,c},{a,b,c}}

Question 10a

b. (foam, venti, whole)
c. {(foam, non-fat), (foam, whole), (no-foam, non-fat), (no-foam, whole)}

Question 10b

b. True
c. True
e. True

Question 10c

d. {01,011,001,0011}
e. {aaa,aaaa,aba,abaa}

Questions 10d

c. {aa,ab,ac,ad}
f. {ab,ac,abac}
g. {(Ø,Ø),(Ø,b),(Ø,c),(Ø,bc),(a,Ø),(a,b),(a,c),(a,bc)}

Question 11a

b. $(B \cup A) \cap (\overline{B} \cup A) = A$

$A \cup (B \cap \overline{B})$	distributive law
$A \cup (\emptyset)$	complement law
$A \cup (\emptyset) = A$	identity law

c.

$A \cap \overline{B} = \cancel{A} \cup B$	
$A \cup \overline{\overline{B}}$	DeMorgans law
$\overline{\overline{A}} \cup B$	Double complement law

Question 11b

b. If A = {a,b} and B = {b} then A - (B ∩ A) = {a} which is not equal to A.
d. If A = {a,b} and B = {c} then (B - A) ∪ A = {a,b,c} which is not equal to A.

Question 11c

b. $A \cap (B - A) = \emptyset$

$A \cap (B \cap \overline{A})$	Set subtraction law
$B \cap (A \cap \overline{A})$	Associative laws
$B \cap (\emptyset) = \emptyset$	Domination laws

c. $A \cup (B - A) = A \cup B$

$A \cup (B \cap \overline{A})$	Set subtraction laws
$(A \cup B) \cap (A \cup \overline{A})$	Distributive law
$(A \cup B) \cap U$	Complement laws
$(A \cup B) \cap U = A \cup B$	Identity laws