Chapter 5 Exercise

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5.1)

a)

$2,4,6 \cup 6,4 \cap 4,6,8$

$2,4,6 \cap 4,6,8$

4,6

b)

$P(7,8,9) - P(7,9)$

$\emptyset$, 7, 8, 9, 7, 8, 7,9, 7,8,9 −

$\emptyset$, 7, 9, 7,9 =

8, 9, 7,8, 7,8,9

c) $P(\emptyset) = \emptyset$

d)

1,3,5 x 0 =

(1,0), (3,0), (5,0)

e) 2,4,6 x $\emptyset = \emptyset$

f)

P(P(2)) =

P($\emptyset$, 2) =

($\emptyset$, 2, $\emptyset$, 2)

5.3)

$|A|$ =n

if set $|A|$ = 1,2,3

P(A) = $\emptyset$,1,2,3, 1,2, 1,3, 2,3, 1,2,3 = 8

$$2^3 = 8$$

Thus, $|P(A)| = 2^{|A|}$

5.5)

a)

$$|P(AxB)| = |A|x|B|$$

$$|P(A)x|P(B)| = 2^{|A|}x2^{|B|}$$

if $|A| = 0$ or $|B| = 0$ both side equals

else case $|AxB|$ will be smaller

thus, the ratio can be larger or smaller than one

5.7)

a) false, an $\emptyset$ has no element while $\emptyset$ will have one element that is the $\emptyset$ itself

b) false, an $\emptyset$ has no element while 0 will have one element

c) true, the cardinality of $\emptyset$ would equal 0 becuase it's empty

d) false, the cardinality of a power set of $\emptyset$ would not equal to zero because

it'll have one element being $\emptyset$

e) true, an $\emptyset$ has no element therefore,

f) false, an $\emptyset$ has no element therefore, it won't be able to satisfy the condition

of natural numbers25055

5.9)

a)

$$A \cap (A \cup B)$$

$$A \cap (A, B) = A, \text{ intersects A}$$

b)

$$\text{A} - (\text{B} \cap \text{C})$$

$$\text{A} - (\text{B, C})$$

$$(A - B) \cap (A - C)$$

5.11)

$$\text{assume} < x, y > = < u, v >$$

$$x = u, y = v$$

$$< u, v > = u, u, v$$

$$x, x, y = u, u, v$$

$$\text{therefore, if} < x, y > then x = u, y = v$$