答案僅供參考

第1題.

(1) $S=\{0,1,2,3\}$ 10

$T=\{1,x,y\}$

$V=\{0,\omega,z\}$

(a) $S\times V=\{(0,0),(0,\omega),(0,z),(1,0),(1,\omega),(1,z),(2,0),(2,\omega),(2,z),(3,0),(3,\omega),(3,z)\}$

(b) S-T-V={2,3}

(c) $S\cap T\cap V=\emptyset$

第2題.

(2)(a) $\forall x\in R(x^2\neq -1)$ 10

- for all values of x which are real numbers $x^2\neq -1$
- TRUTH VALUE - TRUE

(b) $\exists x\in Z(x^2=2)$

- There exists a value x for all integers where $x^2=2$
- TRUTH VALUE - FALSE

第3題.

(3)(a) $\lfloor \frac{1}{2}+\lceil \frac{3}{2}\rceil\rfloor=\lfloor \frac{1}{2}+2\rfloor$ 10

$=\lfloor \frac{5}{2}\rfloor$

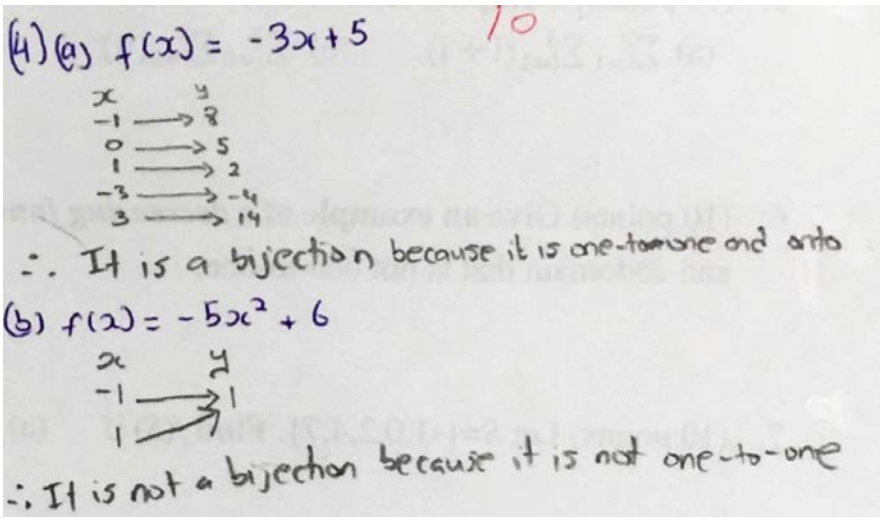
$=2$

(b) $\lfloor -\frac{7}{8}+\lceil -\frac{3}{4}\rceil\rfloor=\lfloor -\frac{7}{8}+0\rfloor$

$=\lfloor -\frac{7}{8}\rfloor$

$=-1$

第4題.



(C)

$$f(x) = \frac{(x^2-1)}{(x+1)} = \frac{(x+1)(x-1)}{(x+1)} = x-1$$

f(-1)=-2

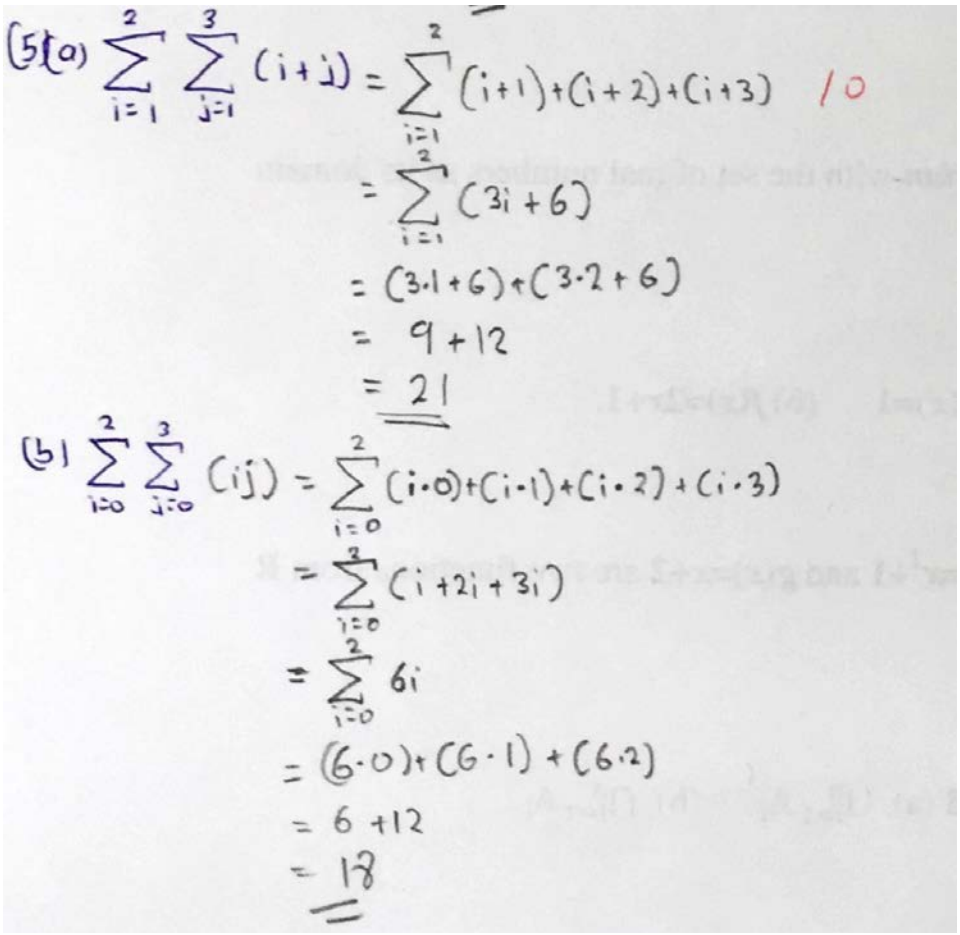
f(0)=-1

f(1)=0

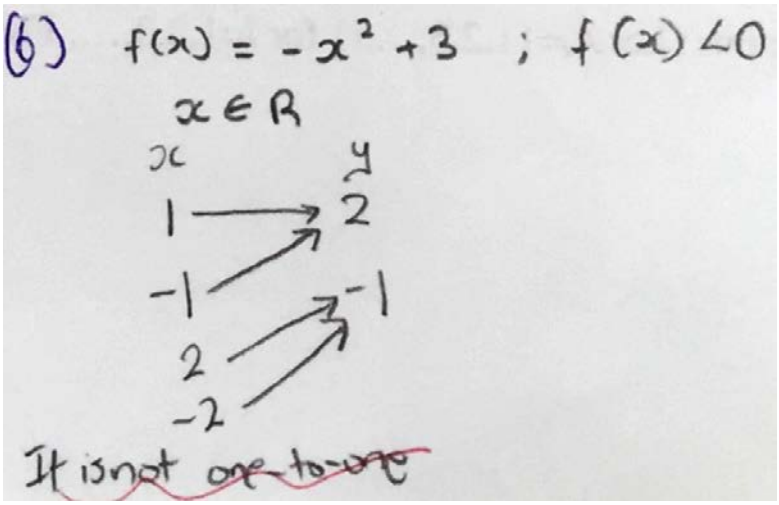
f(2)=1

It is a bijection because it is one-to-one and onto

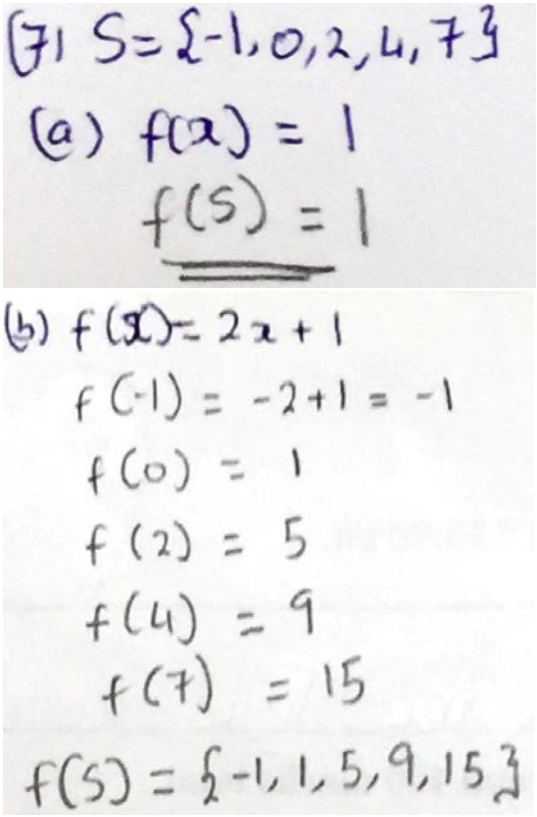
第5題.



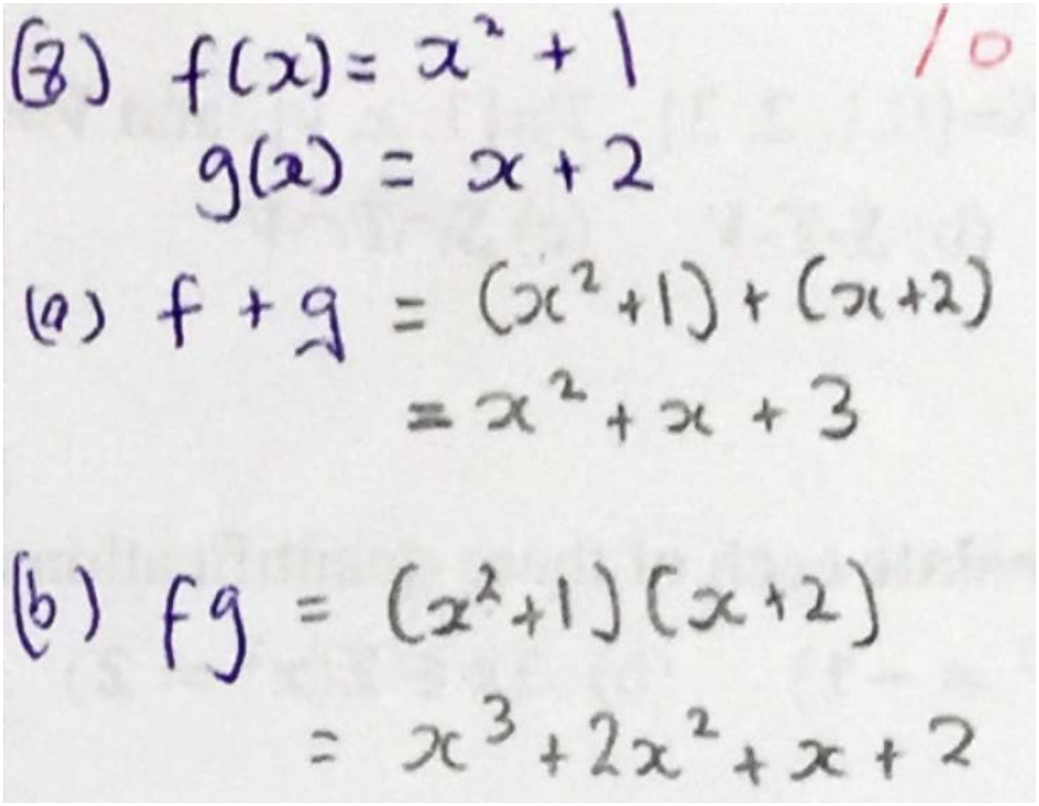
第6題.


(6) $f(x) = -x^2 + 3$; $f(x) < 0$
$x \in R$
x
y
1
2
-1
-1
2
-2
It is not one-to-one

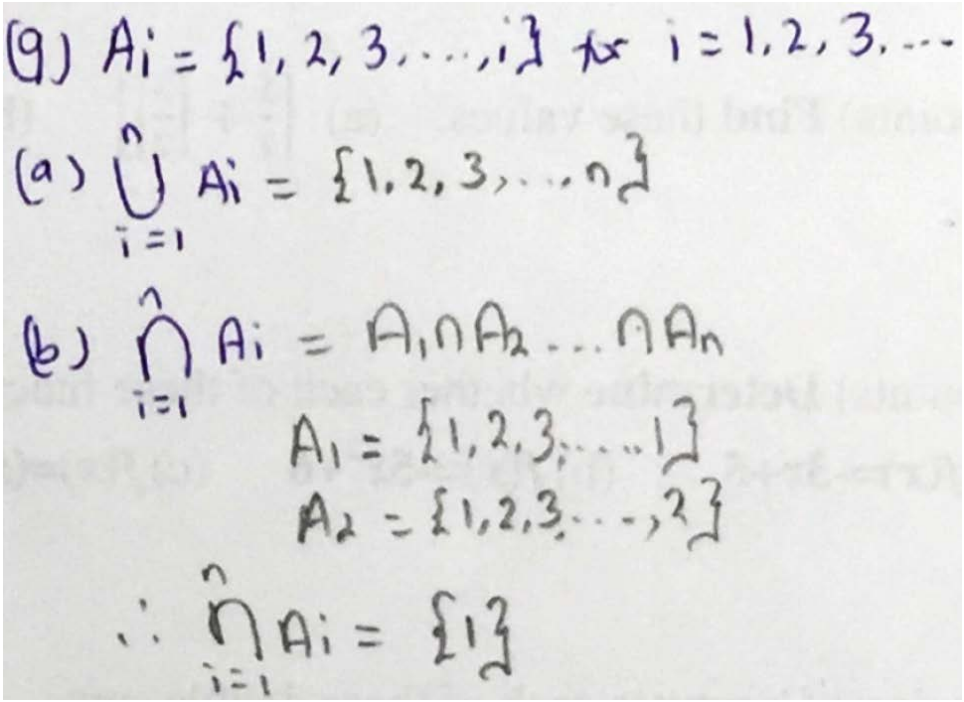
第7題.


(7) $S = \{-1, 0, 2, 4, 7\}$
(a) $f(x) = 1$
$f(S) = 1$
(b) $f(x) = 2x + 1$
$f(-1) = -2 + 1 = -1$
$f(0) = 1$
$f(2) = 5$
$f(4) = 9$
$f(7) = 15$
$f(S) = \{-1, 1, 5, 9, 15\}$

第8題.


(8) $f(x) = x^2 + 1$
$g(x) = x + 2$
(a) $f + g = (x^2+1) + (x+2)$
$= x^2 + x + 3$
(b) $fg = (x^2+1)(x+2)$
$= x^3 + 2x^2 + x + 2$

第9題.


(9) $A_i = \{1, 2, 3, \ldots, i\}$ for $i = 1, 2, 3, \ldots$
(a) $\bigcup_{i=1}^{n} A_i = \{1, 2, 3, \ldots, n\}$
(b) $\bigcap_{i=1}^{n} A_i = A_1 \cap A_2 \ldots \cap A_n$
$A_1 = \{1, 2, 3, \ldots, 1\}$
$A_2 = \{1, 2, 3, \ldots, 2\}$
$\therefore \bigcap_{i=1}^{n} A_i = \{1\}$