Ex 1.3

Q2 (i) Yes, only one arrow from each element A
(ii) No, 2 elements in A go to same element in B
(iii) No, Not all elements in B used
(iv) No, not Both Injective and Surjective.

Q3 (a) = Surjective
(b) = Injective
(c) = Bijective

Q5 (a) Is a function
(b) Is a function and is Injective
(c) Is Not a function
(d) Is a function
(e) Is a function and is Injective
(f) Is a function

Q7 (i) Yes   (ii) Yes

Q8 (i) Range $[-1, \infty)$
(ii) Co-domain = R
(iii) Co-domain $\neq$ Range
(iv) $y \geq -1$
(v) Intersects at more than one pt
(vi) $x \geq 3$.

Q4 Vertical test — Intersects graph more than once

Q13 (i) No, horizontal line intersects more than once
(ii) Yes, horizontal line intersects at least once
(iii) $\pi \leq x \leq 3\pi$

Q14 (i) Yes, horizontal intersects at least once
(ii) No, horizontal line intersects more than once
(iii) $x \geq 0$ and $y \geq 0$

Q15 (i) $y > 0$ or $(0, \infty)$
(ii) Yes, horizontal line intersects at most once
(iii) Yes, horizontal line intersects at least once
(iv) As it is both Injective and Surjective.