

Section 2.1 – Answers

- $\{(1,4),(2,3),(3,3),(4,4)\}$
- $\{(\text{apple},\text{red}),(\text{orange},\text{orange}),(\text{banana},\text{yellow}),(\text{mango},\text{green}),(\text{peach},\text{blue}),(\text{apricot},\text{purple})\}$
-

red	green
green	red
red	red
green	green

4.

Ford	4 doors
Honda	4 doors
Honda	2 doors
Saturn	4 doors

- Yes, it's a function.
- Yes.
- No, it's not a function. For example, "red" in the first coordinate has two possible second coordinates, "green" from the first row and "red" from the third.
- No, Honda is repeated with two different "door" values.
- $A = \{(1,1),(2,1),(2,2)\}$. It's not a function because when x is 2, there are two possible values for y .
- The relation A is shown in the table below. No, it's not a function because when $x = 1$, there are two values for y .

x	y
1	2
1	3
2	3

- $A = \{(1,4),(2,3),(3,2)\}$. Yes, it's a function.
- The relation A is shown in the table below. Yes, it's a function because for each x -value, there is only one y -value.

x	y
1	4
2	2
4	1

- $A = \{(4,1),(6,3)\}$. Yes, it's a function.

14. The relation A is shown in the table below. Yes, it's a function (if there's only one coordinate point, it's hard for it not to be!).

x	y
2	3

15. $C \times C \times C = \{(\alpha, \alpha, \alpha)\}$
 16. $A \times C = \{(0, \alpha), (1, \alpha)\}$
 17. $B \times C = \{(a, \alpha), (b, \alpha)\}$
 18. $A \times A = \{(0, 0), (0, 1), (1, 0), (1, 1)\}$
 19. $B \times B \times A = \{(a, a, 0), (a, a, 1), (a, b, 0), (a, b, 1), (b, a, 0), (b, a, 1), (b, b, 0), (b, b, 1)\}$
 20. $A \times B \times C = \{(0, a, \alpha), (0, b, \alpha), (1, a, \alpha), (1, b, \alpha)\}$
 21. True. $A \times A = \{(0, 0), (0, 1), (1, 0), (1, 1)\}$ and $A \times C = \{(0, 0), (0, 1), (0, 2), (1, 0), (1, 1), (1, 2)\}$.
 Since every ordered pair in the first set is also in the second, yes, it's true.
 22. True. $A \times A = \{(0, 0), (0, 1), (1, 0), (1, 1)\}$ and $C \times A = \{(0, 0), (0, 1), (1, 0), (1, 1), (2, 0), (2, 1)\}$.
 Since every ordered pair in the first set is also in the second, yes, it's true.
 23. False. $B \times A = \{(1, 0), (1, 1), (2, 0), (2, 1)\}$ and $A \times B = \{(0, 1), (0, 2), (1, 1), (1, 2)\}$. In fact, most members of the first set aren't in the second.
 24. False. $C \times A = \{(0, 0), (0, 1), (1, 0), (1, 1), (2, 0), (2, 1)\}$ and $B \times C = \{(1, 0), (1, 1), (1, 2), (2, 0), (2, 1), (2, 2)\}$ and, for example, the ordered pair $(0, 0)$ in $C \times A$ is not in $B \times C$.