Let f be a function from X = {0, 1, 2, 3} to Y = {a, b, c}, define by f (0) = c, f (1) = b, f (2) = b, and f (3) = c. is f:x 🡪 y either one – to – one or onto?

|  |  |
| --- | --- |
| X (Domain) | Y (Codomain) |
| 0 | a |
| 1 | b |
| 2 | c |
| 3 |  |

f = {(0, c), (1, b), (2, b), (3, c)}

Domain = {0, 1, 2, 3}

Codomain = {a, b, c}

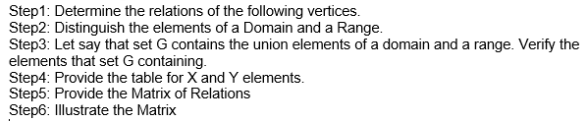
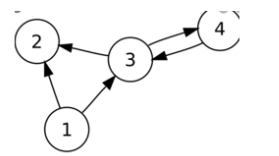
Range = {b, c}

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 8 | 3 | 4 | 9 | 6 |
| 7 | 8 | 5 | 2 | 1 |

2x5 a 1x5 b

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 8 + 3 + 4 + 9 + 6 = 30 | 16 + 6 + 8 + 18 + 12 = 60 | 24 + 9 + 12 + 27 + 18 = 90 | 32 + 12 + 16 + 36 + 24 = 120 | 40 + 15 + 20 + 45 + 30 = 150 |
| 7 + 8 + 5 + 2 + 1 = 23 | 14 + 16 + 10 + 4 + 2 = 46 | 21 + 24 + 15 + 6 + 3 = 69 | 28 + 32 + 20 + 8 + 4 = 90 | 1 + 2 + 3 + 4 + 5 = 15 |



**Step 2**:

Domain = {1, 1, 3, 3, 4}

Range = {(1, 2), (1, 3), (3, 2), (3, 4), (4, 4)}

**Step 3**:

|  |  |
| --- | --- |
| X | Y |
| 1 | 2 |
| 1 | 3 |
| 3 | 2 |
| 3 | 4 |
| 4 | 4 |

G = {1, 3, 4, (1, 2), (1, 2), (1, 3), (3, 2), (3, 4), (4, 4)}

**Step 4:**

**Step 5:**

Relation = {(x1, y2), (x1, y3), (x3, y2), (x3, y4), (x4, y4)}