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CSCI 3236 Homework #1

1. **1. Let X = {a, b, c} and Y {1, 2}.**
   1. **a) List all the subsets of X.**

{∅}, {a}, {b}, {c}, {a,b}, {a,c}, {b,c}, {a,b,c}

* 1. **b) List all the members of X ×Y.**

**{ [a,1], [a,2], [b,1], [b,2], [c1], [c,2] }**

* 1. **c) List all total functions from X to Y.**

| **x** | **y** |  | **x** | **y** |  | **x** | **y** |  | **x** | **y** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **a** | **1** |  | **a** | **2** |  | **a** | **2** |  | **a** | **1** |
| **b** | **1** |  | **b** | **2** |  | **b** | **1** |  | **b** | **2** |
| **c** | **1** |  | **c** | **2** |  | **c** | **1** |  | **c** | **1** |

| **x** | **y** |  | **x** | **y** |  | **x** | **y** |  | **x** | **y** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **a** | **1** |  | **a** | **1** |  | **a** | **2** |  | **a** | **2** |
| **b** | **1** |  | **b** | **2** |  | **b** | **1** |  | **b** | **2** |
| **c** | **2** |  | **c** | **2** |  | **c** | **2** |  | **c** | **1** |

**2. Prove that the set of odd integers is denumerable.**

To prove that the set of odd integers is denumerable every odd number needs to map to a unique natural number.

(n | n >= 0) = (n| 2n + 1)   
Here are all the odd numbers and natural numbers for every odd number the result is always going to have a natural number, which means the set of odd integers is denumerable.