Study unit 7

Activity 7-5

1. *Write down the injective (one-to-one) functions from X to Y*.

(b) X = {2, 4} and Y = {1, 3}:
We can fill in the gaps in the template
{ (2,), (4,) }
so that different pairs contain different elements of Y in two ways, giving the injective functions:
f_1 = { (2, 1), (4, 3) }
and f_2 = { (2, 3), (4, 1) }.

(c) X = {2, 4} and Y = {1, 3, 5}:
We can fill in the gaps in the template
{ (2,), (4,) }
so that different pairs contain different elements of Y in several ways.
f_1 = { (2, 1) , (4, 3) }
f_2 = { (2, 3) , (4, 1) }
f_3 = { (2, 1) , (4, 5) }
f_4 = { (2, 5) , (4, 1) }
f_5 = { (2, 3) , (4, 5) }
f_6 = { (2, 5) , (4, 3) }.

2. *Consider h: $\mathbb{Z} \to \mathbb{Z}$ be defined by g(x) = 2x – 5. Is h injective?*
Assume g(u) = g(v)
then 2u – 5 = 2v – 5
ie u = v.
Therefore h is injective.