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Problem 5:

$$\begin{aligned} a) (f \circ g)(\{5, 7, 8\}) &= f(g(\{5, 7, 8\})) \\ &= f(280) \quad (\text{as } 5 \times 7 \times 8 = 280) \\ &= \{0, 2, 8\} \end{aligned}$$

$$\begin{aligned} (g \circ f)(15234) &= g(f(15234)) \\ &= g(\{1, 2, 3, 4, 5\}) \\ &= 1 \times 2 \times 3 \times 4 \times 5 \\ &= 120 \end{aligned}$$

- b) Domain of variable x is everybody on earth
 $p(x)$ evaluates to true if the person loves animals
 $q(x)$ evaluates to true if the person loves dogs

$\forall x (p(x) \rightarrow q(x))$ demonstrates that with everybody on earth, if they love animals then they certainly love dogs

$\forall x p(x) \rightarrow \forall x q(x)$ means that if everybody on earth love animals then everybody love dog

These 2 are not equivalent as if everybody on earth love animals, there are few people do not certainly love dogs, they can love other animals