

Quiz 1

Date: September 5, 2019

Name:

1. (10 points) Is the function $f(x) = ax + b$ linear? Explain.

Solution: No because $f(x + y) = a(x + y) + b = ax + ay + b \neq f(x) + f(y) = ax + ay + 2b$

2. (10 points) Consider an arbitrary set A with $\text{card}(A) = k$. What is $\text{card}(\mathcal{P}(A))$?

Solution: 2^k

3. (10 points) True or False: $\mathcal{P}(A) \cup \mathcal{P}(B) = \mathcal{P}(A \cup B)$? Sketch a proof or give a counter example to justify your answer.

Solution: False

4. (15 points) What is the cardinality of \mathbb{Z} , the set of integers? Is it countable or uncountable?

Solution: Countably infinite.

\mathbb{Z}	\mathbb{N}
0	1
+k	$2 \times k$
-k	$2 \times k + 1$