MATH310 Groupwork 2022-07-20

NAME:

1. Explicitly list the elements using non-conditional set notation in each of the following sets. Use ellipses if necessary.

   (a) $A = \{n \in \mathbb{Z} \,\big|\, 5 < n \leq 10\}$
   Solution:

   (b) $B = \{x \in \mathbb{R} \,\big|\, x^2 + 6x = -5\}$
   Solution:

   (c) $C = \{x \in \mathbb{R} \,\big|\, x^2 + 3 = 0\}$
   Solution:

   (d) $D = \{5x + 3 \,\big|\, x \in \mathbb{Z}\}$
   Solution:

2. Determine if each of the following elements is in each set. Use $\in$ or $\notin$.

   (a) Is 3 an element of $\{2x + 11 \,\big|\, x \in \mathbb{Z}\}$?
   Solution:

   (b) Is $\mathbb{Z}$ an element of $\mathbb{Z}$?
   Solution:

   (c) Is $\emptyset$ an element of $\{\{\}, \{\{\}\}\}$?
   Solution:

   (d) Is 5 an element of $\mathbb{Q}$?
   Solution:

   (e) Is 5 an element of $\mathbb{C} - \mathbb{R}$?
   Solution:

3. List all the elements in $\mathcal{P}(\{\emptyset, 1\})$

   Solution:

4. Give an example of three sets A, B and C such that $A \in B$, $A \subseteq C$ and $B \nsubseteq C$.

   Solution:

5. Prove that:

$$\left\{ x \in \mathbb{R} \,\middle|\, |x+3| = 5 - |x| \right\} = \{-4, 1\}$$