Mathematics 300

Quiz 3 Name: Key

You must show your work to get full credit.

1. List the elements of the set $S = \{x \in \mathbb{Z} : x^2 < 3\}$ between brackets.

This is the same as $|x| < \sqrt{3} \approx 1.7\ldots$ or $-\sqrt{3} < |x| < \sqrt{3}$

$S = \{-1, 0, 1\}$

2. What can we say about a and b if $|\{a, b\}| = 1$? The set only has one element, so $a = b$.

3. Let $A = \{1, 2\}$ and $B = \{b\}$. Then what are the following:

$A \times B = \{(1, b), (2, b)\}$

$\mathcal{P}(A \times B) = \{\emptyset, \{(1, b)\}, \{(2, b)\}, \{(1, b), (2, b)\}\}$

$\mathcal{P}(A) \times \mathcal{P}(B) = \{(\emptyset, \emptyset), (\emptyset, \{b\}), (\{1\}, \emptyset), (\{1\}, \{b\}), (\{2\}, \emptyset), (\{2\}, \{b\}), (\{1, 2\}, \emptyset), (\{1, 2\}, \{b\})\}$

$\mathcal{P}(A) = \{\emptyset, \{1\}, \{2\}, \{1, 2\}\}$

$\mathcal{P}(B) = \{\emptyset, \{b\}\}$