

Mathematics 300

Quiz 5

Name: Key

You must show your work to get full credit.

1. Write the set $\{1, 2, \dots, 99, 100\}$ in set builder notation.

$$\begin{aligned} & \{n \in \mathbb{Z} : 1 \leq n \leq 100\} \\ \text{or} & \{n \in \mathbb{N} : 1 \leq n \leq 100\} \\ \text{or} & \{n \in \mathbb{N} : n \leq 100\} \end{aligned}$$

2. Write the set $\{a \in \mathbb{Z} : (2a + 1)(a - 1)(a - 2) = 0\}$ in roster notation.

The solutions to the equation $\{1, 2\}$
 or $a = -\frac{1}{2}, a = 1, a = 2$. The number $-\frac{1}{2}$
 is not an integer, so the set is $\{1, 2\}$

3. Recall that an integer is a *perfect square* if and only if it is the square of an integer. That is n is a perfect square if and only if $n = k^2$ for some integer. Let A be the set of perfect squares between 17 and 42. Write A in roster notation.

$A = \{25, 36\}$
 The first few perfect squares are
 $1^2 = 1, 2^2 = 4, 3^2 = 9, 4^2 = 16, 5^2 = 25, 6^2 = 36, 7^2 = 49, \dots$
 So we see the only ones between 17 and 42 are 25 and 36