Discrete Structures

Worksheet 15

Spring 2022
February 22

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1. This question is about *set builder notation*.

   (a) Express each of the following sets using set builder notation.

$$A = \{1, 11, 111, 1111, 11111\} \qquad B = \left\{\frac{1}{2}, \frac{3}{4}, \cdots, \frac{21}{22}\right\} \qquad C = \{2,3,4,5,6\} \times \{110, 111, 112, 113, 114\}$$

   (b) Write out all the elements in each of the following sets.

$$X = \left\{ x \in \mathbf{R} \ : \ \prod_{n=1}^{10} (x - i) = 0 \right\} \qquad Y = \left\{ (a,b,c) \in \{1, \ldots, 12\}^3 \ : \ a^2 + b^2 = c^2 \right\}$$

2. Write the following statements in DNF and in CNF, for u, v, x, y, z, w logical statements.

$$(x \to y) \wedge (z \leftrightarrow x) \qquad\qquad (u \wedge v) \vee (w \wedge x)$$