CS 173, Fall 2015
Examlet 3, Part A

NETID:

FIRST: | **LAST:**

Discussion: Thursday 2 3 4 5 Friday 9 10 11 12 1 2

$A = \{(p, q) \in \mathbb{Z}^2 \mid 3pq + 15p - 5q - 25 \geq 0\}$

$B = \{(s, t) \in \mathbb{Z}^2 \mid t \geq 0\}$

$C = \{(x, y) \in \mathbb{Z}^2 \mid x \geq 0\}$

Prove that $(A \cap B) \subseteq C$.

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$A = \{\lambda(0,3) + (1-\lambda)(2,4) \ \mid \ \lambda \in [0,1]\}$

$B = \{(x,y) \in \mathbb{R}^2 \ \mid \ x \leq y\}$

Prove that $A \subseteq B$.

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$A = \{(x, y) \in \mathbb{R}^2 \mid y = x^2 - 3x + 2\}$

$B = \{(p, q) \in \mathbb{R}^2 \mid p \geq 0\}$

$C = \{(m, n) \in \mathbb{R}^2 \mid n \geq 1\}$

Prove that $A \subseteq B \cup C$.

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$A = \{(x, y) \in \mathbb{R}^2 \mid x = \lfloor 3y + 5 \rfloor\}$

$B = \{(p, q) \in \mathbb{Z}^2 \mid 2p + q \equiv 3 \pmod 7\}$

Prove that $A \cap \mathbb{Z}^2 \subseteq B$.

Use the following definition of congruence mod k: if s, t, k are integers, k positive, then $s \equiv t \pmod k$ if and only if $s = t + nk$ for some integer n.

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$A = \{(p, q) \in \mathbb{R} \mid p = 0\}$

$B = \{(x, y) \in \mathbb{R} \mid (x - 1)^2 + y^2 = 4\}$

$C = \{(s, t) \in \mathbb{R} \mid (s + 1)^2 + t^2 = 4\}$

Prove that $B \cap C \subseteq$ A.

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Discussion: **Thursday 2 3 4 5 Friday 9 10 11 12 1 2**

$A = \{\lambda(3,2) + (1-\lambda)(5,0) \ \mid \ \lambda \in [0,1]\}$

$B = \{(x,y) \in \mathbb{R}^2 \ \mid \ x \geq y\}$

Prove that $A \subseteq B$.