CS 173, Spring 2016
Examlet 3, Part A

NETID:

FIRST:

LAST:

Discussion: Monday 9 10 11 12 1 2 3 4 5

$A = \{(x, y) \in \mathbb{R}^2 \mid x^2 + y^2 \leq 100\}$

$B = \{(p, q) \in \mathbb{R}^2 \mid p \geq 5\}$

$C = \{(a, b) \in \mathbb{R}^2 \mid b \leq 20\}$

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

Hint: notice that $0 \leq (x - y)^2$. So $0 \leq (x^2 + y^2) - 2xy$.

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$A = \{\alpha(2,-4) + (1-\alpha)(-3,6)) \mid \alpha \in \mathbb{R}\}$

$B = \{(a,b) \in \mathbb{R}^2 \mid a \geq 1\}$

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

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

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$A = \{6a + 15b \ : \ a, b \in \mathbb{Z}\}$

$B = \{6p + 10q \ : \ p, q \in \mathbb{Z}\}$

$C = \{n \in \mathbb{Z} \ : \ 6 \mid n\}$

Prove that $A \cap B \subseteq C$. You may assume that if an integer is divisible by two distinct primes m and n, then it is divisible by mn.

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$A = \{(x, y) \in \mathbb{R}^2 \ : \ y = x^2 - 2x - 1\}$

$B = \{(p, q) \in \mathbb{R}^2 \ : \ |p| \geq 3\}$

$C = \{(m, n) \in \mathbb{R}^2 \ : \ n \geq 0\}$

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

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$A = \{(a, b) \in \mathbb{R}^2 \ : \ |a + b| \leq 2\}$

$B = \{(x, y) \in \mathbb{R}^2 \ : \ |x - y + 7| \leq 1\}$

$C = \{(p, q) \in \mathbb{R}^2 \ : \ p \leq 0 \text{ and } q \geq 0\}$

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