Problem 1. How long did you spend on this assignment?

A) < 1 hour

B) Between 1 and 2 hours

C) Between 2 and 3 hours

D) Between 3 and 4 hours

E) > 4 hours

When it makes sense to do so, answer 'C' for "Both" and 'D' for "Neither". You will receive 1/4 point for any question on which you answer 'E' for "I don't know".

Problem 2. Let S and T be sets. Which of the following is equivalent to $S = T$?

A) $\forall x, \left(x \in S \iff x \in T \right)$

B) $\exists x, \left(x \in S \iff x \in T \right)$

Solution. A) □

Problem 3. The sentences $Y \wedge Z$ and $\forall x \in \{Y, Z\}, x$ are equivalent.
  A) True   B) False

Solution. A) □

Problem 4. Which of the following sentences are true?

A) $\forall x \in \mathbb{Z}, \exists y \in \mathbb{Z}, y > x$

B) $\exists x \in \mathbb{Z}, \forall y \in \mathbb{Z}, y > x$

Solution. A) □

Problem 5. Which of the following sentences are true?

A) $\forall x, \Big((x \text{ lives in Los Angeles})$
$$\implies (x \text{ lives in California}) \Big)$$

B) $\Big(\forall x, (x \text{ lives in Los Angeles}) \Big)$
$$\implies \Big(\forall x, (x \text{ lives in California}) \Big)$$

Solution. C) □

Problem 6. In this problem $P(x, y)$ is a sentence involving variables x and y. Which of the following is the logical opposite of $\forall x, \exists y, P(x, y)$?

A) $\forall x, \exists y, \text{not } P(x, y)$

B) $\exists x, \forall y, \text{not } P(x, y)$

Solution. B) □