Warm-Ups 01

This is a preview of the published version of the quiz

Started: Feb 22 at 5:45pm

Quiz Instructions

Before each Recitation, please **complete the associated Warm-Up questions** based on lecture material. These Warm-Up questions are multiple-choice or similar formats, you will receive feedback immediately upon submission, and you may resubmit the Warm-Ups as many times as you wish before the deadline. For maximum benefit, please complete them **after** attending/watching lecture (and optionally reading the accompanying book sections) and **before** recitation.

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Question 1 3 pts

If S is the set of MIT students, and if $P(x)$ is the predicate "Student x took 6.1200", then the statement $\exists\, x \in S.\ (\mathbf{NOT}\ P(x))$
is equivalent to which of the following English sentences? Select all that apply.

- [ ] Every MIT student avoided taking 6.1200.
- [ ] At least one MIT student avoided taking 6.1200.
- [ ] Not all MIT students took 6.1200.
- [ ] No MIT students took 6.1200.

Question 2 3 pts

You want to be a Pokémon master, so you've decided never to venture outside without a Pokéball. You always follow your own rule, even though you aren't always outside and/or carrying a Pokéball. If A is the statement "You're outside", and B is the statement "You have a Pokéball", which of the

following statements will always be true? Choose all that apply.

- [ ] A AND B

- [ ] A IMPLIES B

- [ ] B IMPLIES A

- [ ] NOT (A AND (NOT B))

Question 3 2 pts

The odd squares are the numbers you get by multiplying an odd integer by itself, e.g. $1^2 = 1$, $3^2 = 9$, $5^2 = 25$, $7^2 = 49$, and so on. The students below are attempting to prove the following Theorem:

"Theorem: Every odd square ends in the digit 1, 5, or 9."

Which of their strategies below would suffice to prove this Theorem?

- [ ] Abra attempts a proof by cases: Abra successfully shows that any square that ends in 1 is odd, any square that ends in 5 is odd, and any square that ends in 9 is odd.

- [ ] Bulbasaur tries a proof by contrapositive. Bulbasaur shows that if a square (even or odd) ends in a digit other than 1, 5, or 9, then in fact that square must be even.

Question 4 2 pts

(Answer after reading section 4.1.) For sets A and B, which of the following are equivalent to $A - B$?

- [ ] $\{x \mid (x \in A) \text{ AND } (x \in B)\}$

- [ ] $\{x \mid (x \in A) \text{ OR } (x \in B)\}$

- [ ] $\{x \mid (x \in A) \text{ AND } (x \notin B)\}$

- [ ] $\{x \mid (x \in A) \text{ OR } (x \notin B)\}$

- [ ] $\{x \mid (x \notin A) \text{ OR } (x \in B)\}$

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