Paper Reading

You should not need much background to read this paper. The introduction chapter to the book "The Turing Test. Verbal Behavior as the Hallmark of Intelligence", available from http://www.theturingtest.com/ may be helpful.

Computing Machinery and Intelligence

by A. M. Turing

As you read the first part of the paper, think of it as a design of an experiment. Consider how the experiment has been designed to avoid potential flaws and whether flaws remain.

1. Turing considers the question "Can machines think?" to be meaningless. Why?
2. Read and understand the imitation game between humans

Karl Popper, an influential philosopher in science, suggested a criterion for considering whether a question is scientific: it should be possible to refute the hypothesis by observation.

3. Is the question defined by the game scientific, according to Popper's criterion?

Confounding variables are variables that may affect the outcome of the experiment but were not controlled in the experiment. In other words, they provide an alternate explanation for the outcome of the experiment that may contradict the desired explanation.

4. How does Turing try to control for confounding variables?
5. The game requires the participation of three parties: human, computer and judge. Consider an alternative game between just a judge and a computer with the judge deciding whether the responses of the computer are good enough to grant it the status of being able to think. Criticize this game.
6. The game can also be played sequentially with the judge questioning one party after another, rather than simultaneously with both parties in the other room. What precautions need to be taken in this case?

Maybe the test is too hard on the machine … ☺

7. In what way is the Turing test too demanding as a test of intelligence?
8. Section 3 and 4 describes a digital computer as the machine. You should be familiar with the workings of such machines these days, unlike in 1950. Why does Turing think that the digital computer is appropriate to represent machines in this test?

In the second half of the paper, Turing discusses whether a machine can ever pass the Turing test and whether the test is a reasonable substitute for the question of whether a machine can think.

9. What is Turing's prediction on how machines will do in the imitation game?
10. For each of the objections, examine how Turing argue that it is a fallacy.
    - The theological objection
    - Head in the sand objection
    - Mathematical objection
    - Argument from consciousness
    - Argument from various disabilities
    - Lady Lovelace's argument
    - Argument from the continuity of the nervous system
    - Argument from extrasensory perception
11. What is Turing's suggestion on how a machine that can think may be constructed?
12. What are some of the issues in doing this and how does it help answer earlier objections?
13. Are the results in the paper useful? How are they useful?
14. Where do you think Turing's ideas for the paper came from?

If you are interested, you may want to read on further developments since the paper e.g. on Block's argument, Searle's Chinese Room, Loebner Prize contest, CAPTCHAs. See for example: http://crl.ucsd.edu/~saygin/papers/tt50abs.html.