Mathematical word problem parsing test (20 min)

1. Read the following background and then answer the question. Show all work.

Background: The pogreete of a vonsitor is denoted by the letter P, the suddler is denoted by S, and the tander is denoted by T. By studying many vonsitors, an investigator develops a model and states that $PS = T$. The ratio of S to T is called a vonsitor's brigne, B.

Question: The tander of a vonsitor is 12.8 ophing (an ophing is a unit). A scientist adjusts the vonsitor. It now has its original pogreete and 4 times its original suddler. What is the vonsitor's new tander?

2. Read the following background and then answer the question. Show all work.

Background: An investigator has studied the quantion q, pretony p, sourne s, and unmaston u, of romples. In the following equations, the subscripts i and f denote initial and final quantities. While the pretony of a romple is constant, the quantion of the romple changes according to $q_f = -q_i - 2p(\Delta s)^2$. However, while the pretony is increasing with the sourne, the quantion changes, instead, according to $q_f^3 = q_i^3 + 5p_i\Delta s$. When the pretony is constant, the unmaston changes according to $u_f = u_i + q_i^2\Delta s - 7p(\Delta s)^4$.

Question: The investigator conducted an experiment in which a romple reached a final quantion of 4 at the conclusion of a change in the romple's sourne of 3 that occurred while the romple's pretony maintained a value of 2. The final unmaston of the romple was 6. The romple will now be given an increasing pretony. What was the initial unmaston of the romple at the beginning of the experiment?