A bus has 40 people on it. 28 are students and 20 of the students have backpacks (the rest don't). The remaining people on the bus are not students, but 4 of them have backpacks.

a) Fill the table below

	Backpack (B)	No Backpack (B')	Total
Student (S)	20	8	28
Not Student (S')	4	8	12
Total	24	16	40

a) $P(S) = \frac{28}{40}$ (tot)

c) $P(S \cap B) = \frac{20}{40}$ (tot)

b) $P(S' \cup B) = \frac{20+4+8}{40} = \frac{32}{40}$

e) $P(B \mid S') = \frac{4}{12}$

c) $P(S \mid B') = \frac{8}{16}$

P(are Student If we know no backpack)

P(have Backpack If we know they are not Student)

A rare genetic disease affect 1 in 200 people.
The test for the disease is correct 98% of the time.

a) Draw a tree diagram to show the possibilities for having the disease and the test results

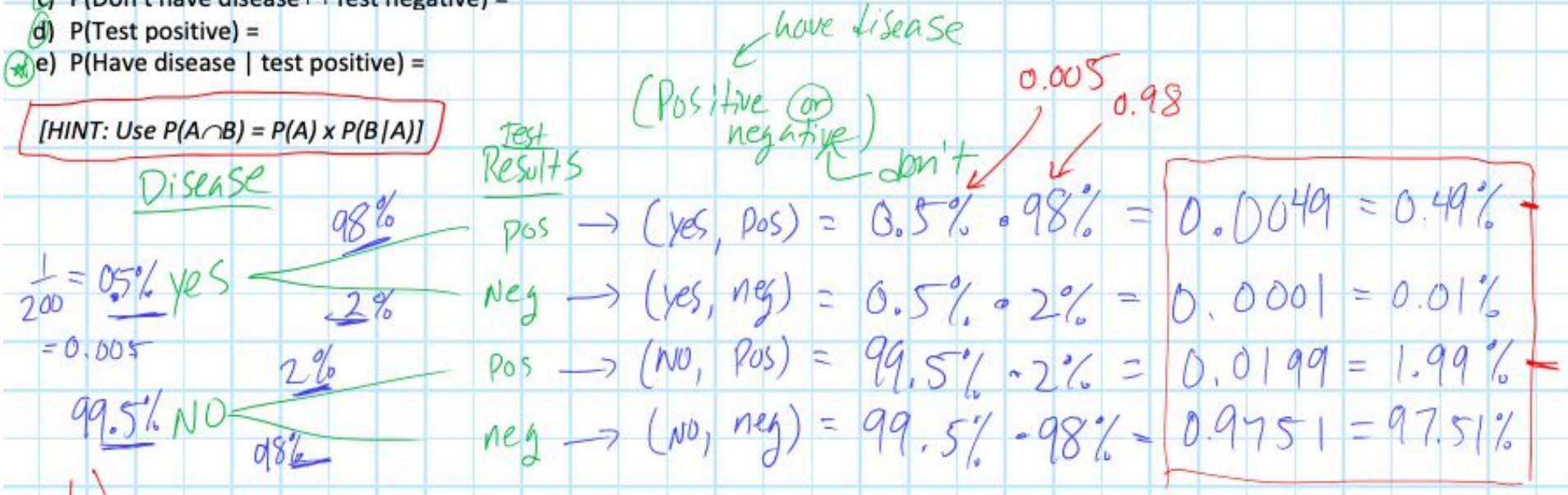
b) P(Have disease ∩ Test positive) =

c) P(Don't have disease ∩ Test negative) =

d) P(Test positive) =

e) P(Have disease | test positive) =

[HINT: Use $P(A \cap B) = P(A) \times P(B|A)$]



b) 0.49%

c) 97.51%

d) 0.49% + 1.99%
= 2.48%

e) P(have disease if we know test positive) = $\frac{0.49\%}{0.49\% + 1.99\%}$

$= 19.76\%$