

NAME: \_\_\_\_\_

SECTION: 001  or  003

**Instructions:**

1. Notes, your text and other books, cell phones, and other electronic devices are not permitted, except as needed to view and upload your work, and except calculators.
2. Calculators are permitted.
- 3.

**Problem 2.** (28 points) A University library has thirteen laptops available for student use. Three are considered good for creators  $C$

(c) (8 points) Let  $S$  be the event that the saliva test is positive.  $P(H|BS) = (.1)(.8)(.7) + [(.1)(.8)(.7) + (.9)(.2)(.3)] = .056 = .11 \quad .5091$

(d) (8 points)  $P(H_1 [ H_2 [ H_3]) =$

Let A be the event that the first ace appears on the 8th draw.  
 Let S be the event that the 10th card drawn is the ace of spades.

$$P(A) = \frac{\binom{48}{7} 7! \binom{4}{1}}{\binom{52}{8} 8!}$$

$$P(AS) = \frac{\binom{48}{7} \binom{3}{1} \binom{43}{1} 7!}{\binom{52}{10} 10!}$$

$$\begin{aligned} P(S|A) &= \frac{P(AS)}{P(A)} \\ &= \frac{\frac{\binom{48}{7} \binom{3}{1} \binom{43}{1} 7!}{\binom{52}{10} 10!}}{\frac{\binom{48}{7} 7! \binom{4}{1}}{\binom{52}{8} 8!}} \\ &= \frac{3}{(4)(44)} \\ &= \frac{3}{176} \end{aligned}$$

An equivalent way to find  $P(AS)$

$$P(AS) = \frac{\binom{48}{8} \binom{3}{1} 8! + \binom{48}{7} \binom{3}{1} \binom{2}{1} 7!}{\binom{52}{10} 10!}$$