AP Stats - Probability Practice MC

Name: Answers Date:

1. Suppose a box contains 3 defective light bulbs and 12 good bulbs. Two bulbs are chosen from the box without replacement. To find the probability that one of the bulbs drawn is good and one is defective, which expression would you use?

a) $\frac{12}{15}+\frac{3}{14}$

b) $\frac{12}{15}\cdot\frac{3}{15}+\frac{3}{15}\cdot\frac{2}{15}$

c) $\frac{12}{15}\cdot\frac{3}{14}$

d) $\frac{12}{15}\cdot\frac{3}{14}+\frac{3}{15}\cdot\frac{12}{14}$

e) $\frac{12}{15}\cdot\frac{11}{14}\cdot\frac{3}{13}\cdot\frac{2}{12}$

P(good 1st and Bad 2nd)
OR
P(Bad 1st and Good 2nd) =

$P(G\cap B)\cup P(B\cap G) =$

$\left(\frac{12}{15}\cdot\frac{3}{14}\right)+\left(\frac{3}{15}\cdot\frac{12}{14}\right)$

2. When two fair dice are rolled, what is the probability of getting a sum of 7 given that the first die rolled is an odd number?

a) $\frac{1}{6}$

b) $\frac{1}{9}$

c) $\frac{1}{2}$

d) $\frac{1}{12}$

$P(7|\text{odd}^{1st}) = \frac{P(7\cap \text{odd}^{1st})}{P(\text{odd}^{1st})}$

$\frac{3}{18}$

36 rolls
18 odd

Sums to 7 and start odd
1, 6
3, 4
5, 2

3. At a certain high school, 1/7 of all students take the AP Statistics, ¼ of all students play football, and these two events are independent. If a student is chosen at random from the school, what is the probability that the student is involved in at least one of these two pursuits?

a) $\frac{7}{28}$

b) $\frac{9}{28}$

c) $\frac{11}{28}$

d) $\frac{13}{28}$

e) $\frac{5}{14}$

$P(AP \cap \text{football}) = 1/7 \cdot 1/4 = 1/28$

$P(AP \cup \text{football}) =$

$P(AP) + P(\text{football}) - P(AP \cap \text{football})$

$1/7 + 1/4 - 1/28 = 10/28 = 5/14$

4. Based on concerns over the eating habits and fitness level of school-aged children, the school board of a large district decided to offer healthy choices in the school cafeterias. They randomly selected students from all grade levels and provided them with proposed menus for their healthier lunches. Students were asked if they would purchase these lunches. The results of the survey are summarized in the table below by grade level.

	K to 5	6 to 8	9 to 12	Total
Yes	6,231	5,964	3,493	15,688
No	2,016	1,912	3,939	7,867
	8,247	7,876	7,432	23,555

given

What is the probability that a high school student selected at random would not plan to purchase the proposed healthier lunch?

$P(\text{No} \mid 9\text{ to }12) = \frac{3939}{7432}$

a) 0.1672

b) 0.3339

c) 0.5300

d) 0.5007

e) 0.9447

= So indep. (cross out E)

5. Suppose A and B are events with given probabilities: P(A) = ¾ and P(B) = ½, and P(B given A) = ½. Which of the following conclusions can NOT be drawn from the given information?

~~a)~~ $P(A \text{ and } B) = \frac{3}{8}$

~~b)~~ $P(A \text{ or } B) = \frac{7}{8}$

c) $P(A \text{ given } B) = \frac{1}{2}$

~~d)~~ A and B are not mutually exclusive events.

~~e)~~ A and B are independent events.

since indep.

$P(A \cap B) = P(A) \cdot P(B) = 3/4 \cdot 1/2 = 3/8$

(eliminate A and D)

$P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$3/4 + 1/2 - 3/8 = 7/8$

(eliminate B)

check

$P(A \mid B) = \frac{P(A \cap B)}{P(B)} = \frac{3/8}{1/2} = \frac{3}{8} \cdot 2 = 6/8 = 3/4$

C is not correct so it is the answer