

**Mutually Exclusive Events Quiz**

1. A high school science teacher has 78 students. Of those students, 35 are in the band and 32 are on a sports team. There are 16 students who are not in the band or on a sports team. One student from the 78 students will be selected at random. Let event  $B$  represent the event of selecting a student in the band, and let event  $S$  represent the event of selecting a student on a sports team.

Are  $B$  and  $S$  mutually exclusive events?

(A) No, because  $P(B \cap S) = \frac{5}{78}$ .



(B) No, because  $P(B \cap S) = \frac{48}{78}$ .

(C) No, because  $P(B \cap S) = \frac{62}{78}$ .

(D) Yes, because  $P(B \cap S) = \frac{5}{78}$ .

(E) Yes, because  $P(B \cap S) = \frac{62}{78}$ .

**Answer A**

Correct. The sum of 35, 32, and 16 is 83, which is 5 greater than 78. So there must be 5 students who are both in the band and on a sports team. Because the events can occur at the same time, they are not mutually exclusive.

2.

	Team		
	Home	Away	Total
Purchased food	120	40	160
Did not purchase food	60	30	90
Total	180	70	250

The table shows data that were collected from people who attended a certain high school basketball game and indicates the team each person rooted for and whether each of these people purchased food during the game. A person who attended the game will be selected at random. Which of the following correctly interprets mutually exclusive events represented by the table?

(A) Rooting for the home team and rooting for the away team



(B) Rooting for the home team and purchasing food during the game

(C) Rooting for the away team and purchasing food during the game

(D) Rooting for the home team and not purchasing food during the game

(E) Not rooting for the home team and not purchasing food during the game

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### Answer A

Correct. Based on the table, each person either rooted for the home team or rooted for the away team. Because the events cannot occur at the same time, the events are mutually exclusive.

3. As a promotion, the first 50 customers who entered a certain store at a mall were asked to choose from one of two discounts. The first discount choice was 20% off all purchases made that day. The second discount choice was 10% off all purchases for the week. Of those who received the discounts, 28 chose the first discount and 22 chose the second discount. One customer will be selected at random from those who received a discount. Let  $F$  represent the event that the selected person chose the first discount, and let  $S$  represent the event that the selected person chose the second discount.

Are  $F$  and  $S$  mutually exclusive events?

(A) Yes, because  $P(F \cap S) = 0$ .



(B) Yes, because  $P(F \cap S) = 0.12$ .

(C) Yes, because  $P(F \cap S) = 1$ .

(D) No, because  $P(F \cap S) = 0$ .

(E) No, because  $P(F \cap S) = 1$ .

### Answer A

Correct. A person could choose only one discount. Because the events cannot occur at the same time, the events are mutually exclusive.