

135. Constructing Venn Diagrams for Probability

Practice Questions

1. In a class of 40 students, 25 study French, 20 study Spanish, and 10 study both. Construct a Venn diagram and find the probability of a student studying only French.
2. A survey of 100 people shows that 60 like tea, 50 like coffee, and 30 like both. Construct a Venn diagram and find the probability of choosing someone who likes neither.
3. In a group of 50 students, 30 like Maths, 20 like Science, and 15 like both. Construct a Venn diagram and find the probability of a student liking only Science.
4. In a sports club, 35 members play football, 25 play basketball, and 15 play both. Construct a Venn diagram and find the probability of selecting a member who plays neither sport.
5. A class of 40 students has 18 who play piano, 22 who play guitar, and 10 who play both. Construct a Venn diagram and find the probability of a student playing piano or guitar.
6. In a group of 80 people, 40 own a dog, 30 own a cat, and 20 own both. Construct a Venn diagram and find the probability of selecting a person who owns only a dog.
7. A survey of 90 customers shows that 50 prefer Pepsi, 45 prefer Coke, and 20 like both. Construct a Venn diagram and find the probability of choosing someone who likes neither.
8. A school has 100 students, where 60 study History, 55 study Geography, and 35 study both. Construct a Venn diagram and find the probability of selecting a student studying only Geography.
9. A theme park survey shows that 200 visitors like roller coasters, 150 like water rides, and 80 like both. Construct a Venn diagram and find the probability of choosing a visitor who likes at least one of these.
10. A club has 50 members, where 30 like chess, 25 like puzzles, and 12 like both. Construct a Venn diagram and find the probability of selecting a member who likes only puzzles.

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Scenario Questions

1. A university survey records students studying Maths and Physics. If 70 study Maths, 50 study Physics, and 30 study both, construct a Venn diagram and find the probability of picking a student studying neither subject.
2. A music streaming service finds that 40% of users listen to rock, 35% listen to pop, and 20% listen to both. Draw a Venn diagram and find the probability of a user listening to at least one of these genres.
3. A supermarket survey records 100 shoppers, where 60 buy fruit, 50 buy vegetables, and 35 buy both. Construct a Venn diagram and find the probability of selecting a shopper who buys only fruit.
4. A football club has 80 fans supporting Team A, 60 supporting Team B, and 30 supporting both. Draw a Venn diagram and find the probability of randomly selecting a fan who supports neither team.
6. A mobile phone store records that 200 customers buy iPhones, 150 buy Android phones, and 80 buy both. Construct a Venn diagram and find the probability of choosing a customer who buys at least one type of phone.
7. A university records that 250 students take Chemistry, 200 take Biology, and 100 take both. Construct a Venn diagram and find the probability of a student taking neither subject.
8. A movie survey finds that 70 people like action movies, 50 like comedies, and 30 like both. Draw a Venn diagram and find the probability of selecting someone who likes only comedies.
9. A business survey finds that 100 employees prefer working from home, 80 prefer working in the office, and 40 like both. Construct a Venn diagram and find the probability of choosing someone who prefers only working from home.
10. A holiday booking company records that 300 customers book beach holidays, 250 book mountain holidays, and 150 book both. Construct a Venn diagram and find the probability of choosing a customer who books at least one type of holiday.

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Practice Questions

1. Probability of studying only French: $\frac{15}{40} = 0.375$
2. Probability of liking neither: $\frac{20}{100} = 0.2$
3. Probability of liking only Science: $\frac{5}{50} = 0.1$
4. Probability of playing neither sport: $\frac{5}{75} \approx 0.0667$
5. Probability of playing piano or guitar: $\frac{30}{40} = 0.75$
6. Probability of owning only a dog: $\frac{20}{80} = 0.25$
7. Probability of liking neither: $\frac{15}{90} \approx 0.1667$
8. Probability of studying only Geography: $\frac{20}{100} = 0.2$
9. Probability of liking at least one: $\frac{270}{330} \approx 0.8182$
10. Probability of liking only puzzles: $\frac{13}{50} = 0.26$

Answers

Scenario Questions

1. Probability of studying neither: $\frac{10}{90} \approx 0.1111$
2. Probability of listening to at least one genre: 0.55
3. Probability of buying only fruit: $\frac{25}{100} = 0.25$
4. Probability of supporting neither team: $\frac{10}{110} \approx 0.0909$
5. Probability of buying at least one type of phone: $\frac{270}{330} \approx 0.8182$
6. Probability of taking neither subject: $\frac{50}{350} \approx 0.1429$
7. Probability of liking only comedies: $\frac{20}{90} \approx 0.2222$
8. Probability of preferring only working from home: $\frac{60}{140} \approx 0.4286$
9. Probability of booking at least one type of holiday: $\frac{400}{450} \approx 0.8889$