

# Mathematics: Venn Diagrams

## Find Probabilities from Venn diagrams

### Key Points

$A \cup B$  means 'A union B' and is made up of all of the elements that are in set A or set B or both.

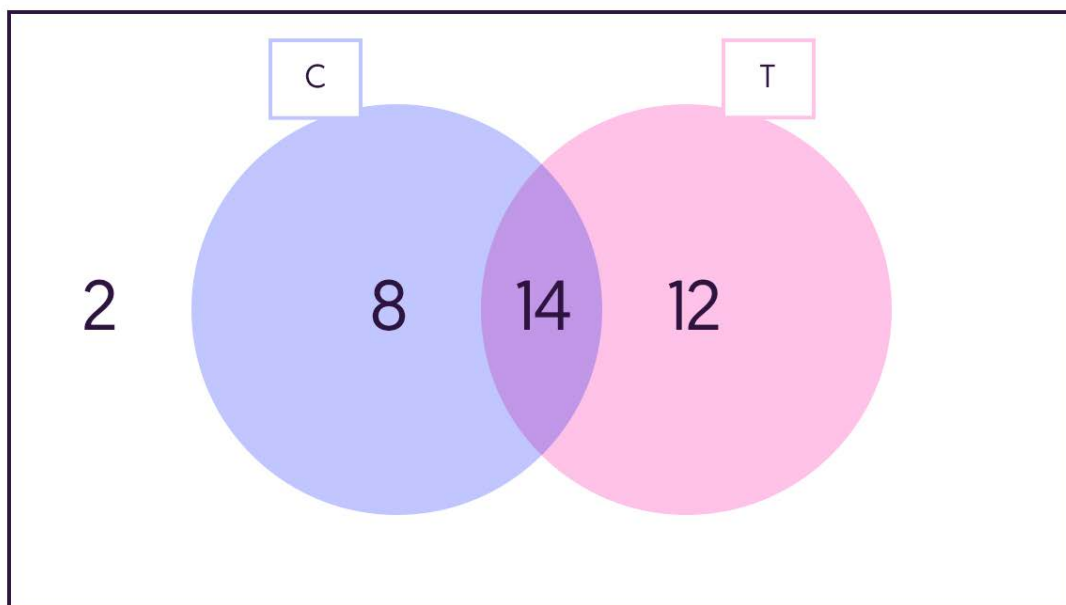
$A \cap B$  means 'A intersection B' and is made up of all of the elements that are in set A and in set B.

$A'$  means 'complement of A' and is all of the elements that are not in set A.

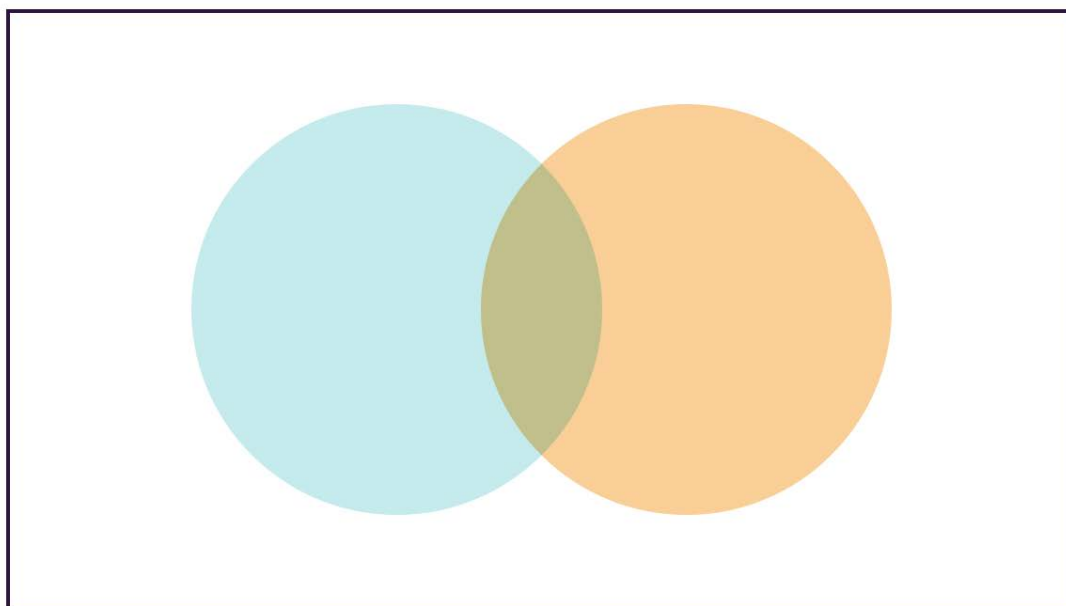
Use the image below to answer questions 1–8.

Give your answers as fully simplified fractions.

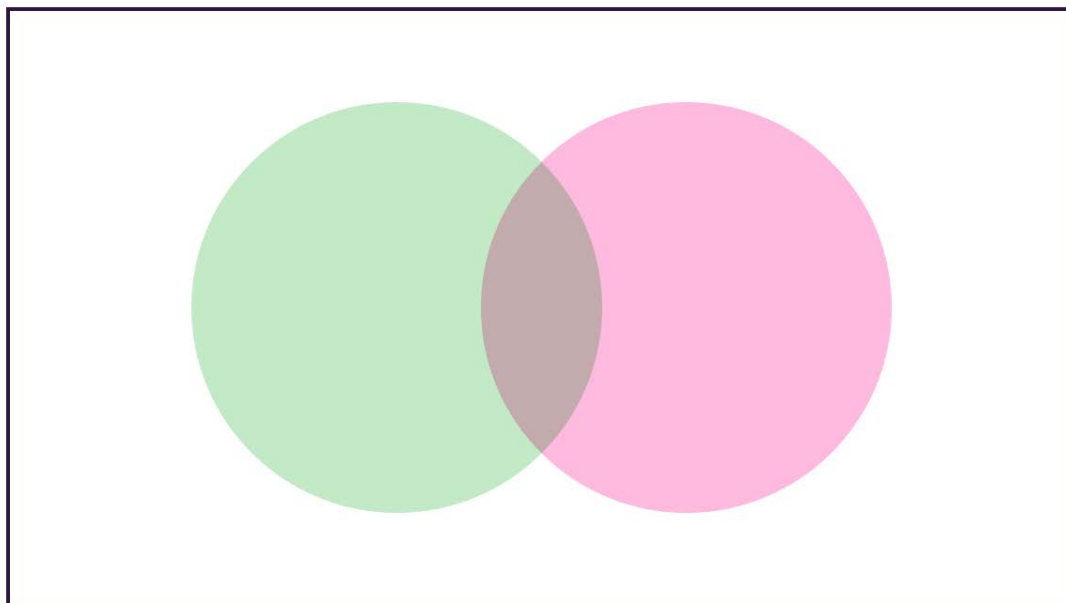
The Venn diagram shows the number of students participating in cricket and tennis lunchtime clubs.



1. Calculate  $P(T)$
2. Calculate  $P(C)$
3. Calculate  $P(C \cup T)$
4. Calculate  $P(C \cap T)$
5. Calculate  $P(T')$
6. Calculate  $P(C')$
7. Calculate  $P(C' \cap T')$
8. Calculate  $P(C \cap T')$
9. There are 30 people in a class. 22 of them buy food from the café at lunch time. 18 bring a packed lunch. All of them either bring a packed lunch or buy food from the café or do both.
  - a. Represent this information in the Venn diagram below:



- b. What is the probability that a student picked at random brings a packed lunch and also buys food?
10. Sienna carries out a survey in her school to find out what type of music 400 people like listening to. 178 like listening to pop music. 298 like listening to rock music. 108 like listening to both pop and rock music. Some people did not like either kind of music.
  - a. Display this information in a Venn diagram:



- b. Use your diagram to calculate the probability of a student picked at random liking both rock and pop music.