

(1) Which of these sentences are propositions? What are the truth values of those that are propositions?

- Boston is the capital of Massachusetts
- Miami is the capital of Florida.
- $2 + 3 = 5$
- $5 + 7 = 10$
- $x + 2 = 11$
- Answer this question
- 5^{100} is a large number.

(2) Which of these are propositions? What are the truth values of those that are propositions?

- Do not pass go.
- What time is it?
- $4 + x = 5$
- The moon is made of green cheese.
- $2^n \geq 100$

(3) What is the negation of each of these propositions?

- Mei has an MP3 player.
- There is no pollution in New Jersey.
- $2 + 1 = 3$
- The summer in Maine is hot and sunny.

(4) What is the negation of each of these propositions?

- Jennifer and Teja are friends.
- There are 13 items in a baker's dozen.
- Abby sent more than 100 text messages every day.
- 121 is a perfect square.

(5) Let p and q be the propositions.

p : You drive over 65 miles per hour.

q : You get a speeding ticket.

Write these propositions using p and q and logical connectives (including negations).

- You do not drive over 65 miles per hour.
- You drive over 65 miles per hour, but you do not get a speeding ticket.
- You get a speeding ticket, but you do not drive over 65 miles per hour.

(6) For each of these sentences, determine whether an inclusive or, or an exclusive or, is intended. Explain your answer.

- Coffee or tea comes with dinner.
- A password must have at least three digits or be at least eight characters long.
- The prerequisite for the course is a course in number theory or a course in cryptography.
- You can pay using U.S. dollars or euros.