Inclusion-Exclusion Principle Exercise

Question 1:

A survey on a sample of 45 new cars being sold at a local auto dealer was conducted to see which of the three popular options - air conditioning, radio and power windows were already installed. The survey found:

20 had air conditioning
12 had air conditioning and power windows
15 had radio
6 had air conditioning and radio
22 had power windows
7 had radio and power windows
4 had all three options.

Find the number of cars that had:

a) Only power windows
b) Only air conditioning
c) Only radio
d) Radio and power windows but not air conditioning
e) Air conditioning and radio but not power windows
f) Only one of the options
g) At least one option
h) None of the options

Question 2:

Each student in Arts at college has a mathematics requirement **A** and a science requirement **B**.
A poll of 140 students shows that:

60 Completed **A**, 45 completed **B**, 20 completed both **A** and **B**.

Use a Venn diagram to find the number of students who have completed:

a) At least one of **A** and **B**
b) exactly one of **A** or **B**
c) Neither **A** nor **B**.
d) Only **A**
e) Only **B**

Question 3:

In a survey of 140 people, it was found that:

75 read Sunday magazine,
30 read Sunday magazine and Time,
50 read Time,
25 read Sunday magazine and Spider,
45 read Spider,
20 read Time and Spider,
10 read all three magazines.

a) Find the number of people who read at least one of the three magazines.
b) Fill in the correct number of people in each of the eight regions of the Venn diagram.
c) Find the number of people who read exactly one magazine.
d) Find the number of people who does not read any of three magazines.