Algebra puzzles

Three children play tennis. They are all different ages.

When Rory and Sam play each other the total of their ages is 24.
When Tom and Sam play each other the total of their ages is 19.
When Tom and Rory play each other the total of their ages is 21.

1. Who you think is the oldest? Explain why you think that is.
2. Who do you think is the youngest?
3. Use the letter R to stand for Rory's age, the letter S to stand for Sam's age and the letter T to stand for Tom's age. Write three additions (one for each statement above) to show the information you know.
4. Use your first and second additions to help you work out how many years older Rory is than Tom.
5. Use your second and third additions to help you work out how many years older Rory is than Sam.
6. Now write their names in order of age, starting with the oldest. Write the age differences between them.
7. Can you work out how old each person is? Remember to use the information you have found out. Compare the different additions. You could even add together or subtract the additions to find new information.

   Rory's age = ☐ Sam's age = ☐ Tom's age = ☐
8. Check that each statement above is true for the ages you have found.
9. What is the total of all three children's ages?

Four adults play tennis. The adults are all different ages.

When Amy and Ben play each other the total of their ages is 80.
When Clio and Ben play each other the total of their ages is 100.
When Clio and Dan play each other the total of their ages is 75.
When Ben and Dan play each other the total of their ages is 95.

10 Use the letters A, B, C and D to stand for the ages of the adults. Write four additions (one for each statement above) to show the information you know.

11 Use your first and second additions to help you work out whether Amy is older or younger than Clio and by how many years.

12 Use your second and third additions to help you work out whether Ben is older or younger than Dan and by how many years.

13 Use your third and fourth to help you work out whether Ben is older or younger than Clio and by how many years.

14 Now write their names in order of age, starting with the oldest. Write the age differences between them.

15 Can you work out how old each person is? Remember to use the information you have found out.

Amy's age = ☐ Ben's age = ☐ Clio's age = ☐ Dan's age = ☐

16 Check that each statement above is true for the ages you have found.

17 What is the total of all four adults' ages?

18 Choose three or four names of people and their ages. Make up a similar puzzle for a partner to solve.

Swindling Syd offers you a job for 50 days.

You can either be paid:

1p on day 1		£100 on day 1
2p on day 2	**OR**	£200 on day 2
4p on day 3		£300 on day 3
8p on day 4		£400 on day 4
(Double the previous day)		(Add £100 each day)

1. Which do you think is better?
2. How much would you be paid on the 20th day using each system?
3. Would you change your mind now?
4. Which is the better deal?
5. Can you work out how much you would be paid in total for the second option?