WARM UP

1. Use (i) the four digits 2, 2, 4, 7 each once and only once and (ii) one or more of the four the operators + ,- ,× ,÷ and brackets as required, all without restriction, to attempt to generate the values 1, 2, 3,……, 25 in turn.

   Are there such values for which you find that this is not possible?

2, (a) Five circular discs, each of radius 10 cm, are to be placed within a rectangle on a horizontal surface such that they do not overlap one with another.

   (i) What is the area of the smallest (by area) rectangle for which this is possible?

   (ii) What is the area of the smallest (by area) square for which this is possible?

   (b) Four circular discs, each of radius 10 cm, are to be placed within a rectangle on a horizontal surface such that they do not overlap one with another.

   (i) What is the area of the smallest (by area) rectangle for which this is possible?

   (ii) What is the area of the smallest (by area) square for which this is possible?