

# 2010 Challenge & Enrichment

See your Maths Teacher to enter

## PROBLEM

Four runners, Hayat, Imogen, Jocasta and Katarina, have been selected for a relay team. Their coach allows them to decide the order in which they will run but he sets the following conditions:

- i) If Katarina starts, then Jocasta must run third.
- ii) If Hayat or Katarina run second, then Jocasta must start.
- iii) Imogen runs second if and only if Hayat runs third.
- iv) If Katarina runs third, then Hayat must run second.
- v) If Katarina runs last, then Jocasta must run third and Hayat starts.

List all the running orders which follow the coach's conditions.

## PROBLEM

Aileen, Bala, Cara and Darcy played the friendly game called 'double the others'. Each had several marbles. Aileen used some of her marbles to double the number of marbles each of the other players had. Bala then used some of the marbles he now had to double the number of marbles each of the other players had. Cara then did the same followed by Darcy. All of the players finished with 16 marbles. How many marbles did each of them have at the start?

