Please do not write on the subject, and do not forget to hand it back at the end.

SEQUENCES

To raise money for a charity, three friends, Alex, Beth and Chris were sponsored £1 for each kilometre they ran over a ten-day period.

They receive sponsorship proportionally for partial kilometres completed.

Alex ran 3km every day.

Beth ran 1km and on each subsequent day she ran 50% further than the previous day.

The performances of Chris for the first four days are shown in the table below, and she went on increasing her distance with the same progression for the rest of the ten-day period.

day	1	2	3	4
distance in km	2	3.500	5	6.500

1) How far did Beth run on day 5, to the nearest 10 metres?

2) What is the first day when Chris ran further than 10km?

3) Find the total amount raised by the three friends by the end of the ten days.

Give your answer rounded to the nearest penny.

NB:

- for any real number q different from 1, and for any integer n:

$$1 + q^1 + q^2 + q^3 + \cdots + q^n = \frac{1 - q^{n+1}}{1 - q}$$

- for any integer n :

$$1 + 2 + 3 + \cdots + n = \frac{n(n + 1)}{2}$$