Farmer Ben has a rectangular vegetable garden that measures 4.5 metres by 9 metres. Unfortunately, the local hungry rabbits are eating all he grows. Being a peaceful man, Ben decides to build a 7.5 metre by 12 metre fence around the garden to protect his harvest.

a) If the garden is centered in the fenced area, how much distance is there between the fence and each edge of the garden?

b) If Ben expands his garden next year to use the whole area inside the fence, how much more planting area will he have, compared to this year?
Hints

**Hint 1** - Draw a careful diagram showing both the garden and the fence and their dimensions.

*Suggestion*: Supply students with graph paper to encourage accurate diagrams.
Solution

a) From the diagram, we see that if the garden is centred, the difference of 3 m in each dimension will be evenly split, giving a distance of 1.5 metres between the fence and each edge of the garden.

b) Since the new planting area will be $7.5 \times 12 = 90$ square metres, and the original garden was $4.5 \times 9 = 40.5$ square metres, Ben has added 49.5 square metres, i.e., he has more than doubled his planting area.