**[Problem 1]**

Your track and field coach wants a long jump pit for the school. He needs your help to plan the design.

The long jump pit must meet the following specifications:
- The pit must be between 6 and 10 metres long inclusively.
- The pit must be twice as wide as the runway.
- The depth of the sand in the pit must be between 40 and 60 cm inclusively.
- The runway must be at least 20 metres long and at least 1 metre wide.
- The concrete in the runway must be between 10 and 15 cm thick inclusively.

Indicate the dimensions of the pit and runway on the following diagram.

width of pit = _____

length of pit = _____   Pit

length of runway = _____   Runway

width of runway = _____
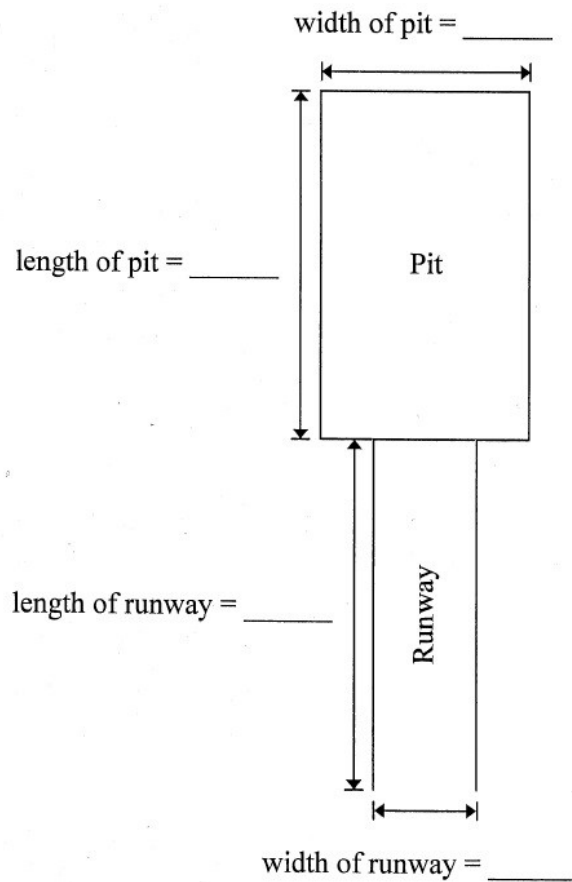
a) You need to put up a border around the pit made of wooden boards. How many wooden boards will you need to buy if each board is 4.9 metres long?

b) You need to order sand to fill the pit. How much sand will you need to order? The sand company takes orders in units of **cubic metres**.

c) You need to order concrete to pour the runway. How much concrete will you need to pour? The concrete company takes orders in units of **cubic cm**.

[Problem 2]

Your neighbour has asked you to design an in-ground swimming pool with a surrounding walkway and accompanying eating space in her 40 ft. by 60 ft. Backyard. You are given the following instructions.

- The swimming pool must have a minimum area of 400 ft^2
- There must be a 5 ft. wide concrete walkway around the swimming pool.
- There must be a circular concrete eating space with an area of at least 250 ft^2
- The rest of the backyard will be a lawn and must have an area of the at least 400 ft^2

a) Complete the scale diagram. Indicate the dimensions and location of the swimming pool, the walkway, and the eating space. Calculate the area of the lawn for your diagram.

Scale: 1 square = 2 feet

60 ft.

40 ft.
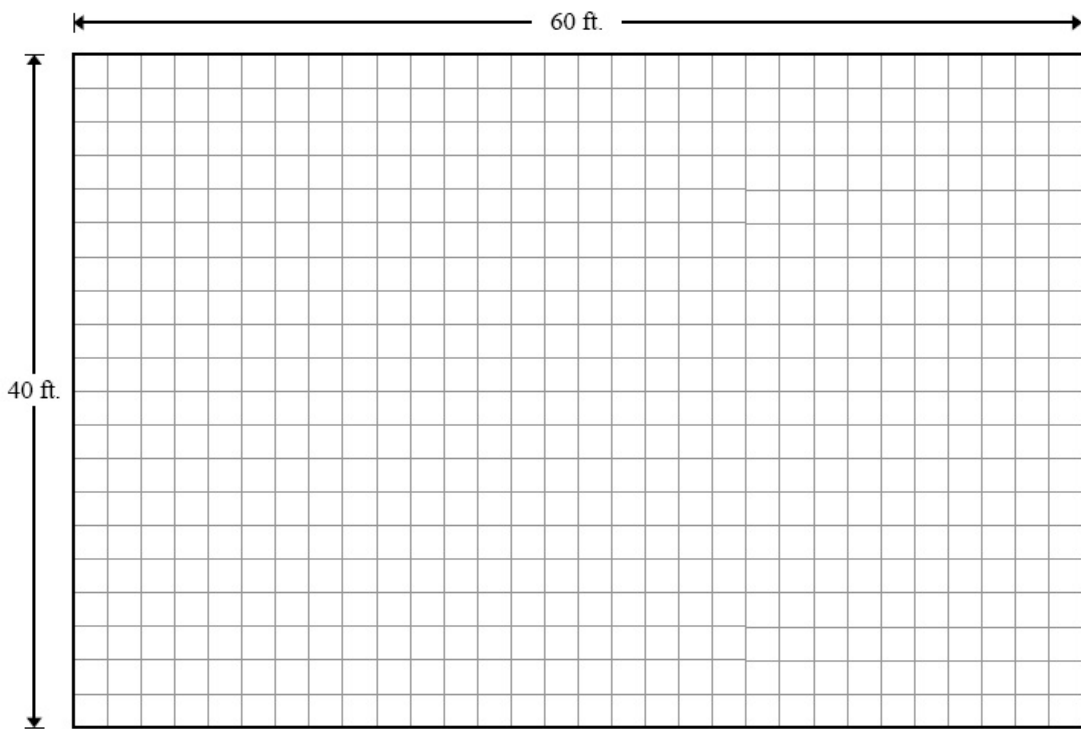
area of the lawn = _____

b) You need to excavate soil in order to build the pool.

- – The swimming pool will have a uniform depth of 5 ft
- – The hole must be 1 ft. Longer and 1 ft. Wider than the dimensions of the swimming pool (0.5 ft. On each side).

Determine the volume of dirt that you will need to excavate to build the pool.

c) You need to buy concrete to pour for the walkway around the pool and for the eating space. You must pour the concrete to a depth of 6 inches thick. Concrete costs $105.00 per yd3.

How much will it cost you to buy and pour the concrete?