

# Area Measurement

It is essential to know the amount of area that you intend to cover when applying a pesticide or fertilizer. Turf areas such as home lawns and golf course greens, tees and fairways should be measured in square feet or acres, depending upon the units needed.

## Rectangular Areas



Area = Length ( $l$ ) x Width ( $w$ )

### Example:

What is the area of a lawn that is 150 meters long by 75 meters wide?

$$\begin{aligned} \text{Area} &= 150 \text{ meters} \times 75 \text{ meters} \\ &= 11,250 \text{ square meters} \end{aligned}$$

By using the following equation, it is possible to determine the area in hectares.

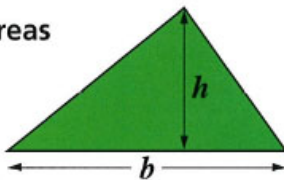
$$\text{Area in hectares} = \frac{\text{Area in square meters}}{10,000 \text{ square meters per hectare}}$$

(There are 10,000 square meters in a hectare)

### Example:

$$\begin{aligned} \text{Area in hectares} &= \frac{11,250 \text{ square meters}}{10,000 \text{ square meters per hectare}} \\ &= 1.125 \text{ hectares} \end{aligned}$$

## Triangular Areas



$$\text{Area} = \frac{\text{Base } (b) \times \text{Height } (h)}{2}$$

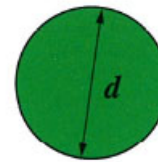
### Example:

The base of a corner lot is 120 meters while the height is 50 meters. What is the area of the lot?

$$\begin{aligned} \text{Area} &= \frac{120 \text{ meters} \times 50 \text{ meters}}{2} \\ &= 3,000 \text{ square meters} \end{aligned}$$

$$\begin{aligned} \text{Area in hectares} &= \frac{3,000 \text{ square meters}}{10,000 \text{ square meters per hectare}} \\ &= 0.30 \text{ hectares} \end{aligned}$$

## Circular Areas



$$\text{Area} = \frac{\pi \times \text{Diameter}^2 (d)}{4}$$

$$\pi = 3.14159$$

### Example:

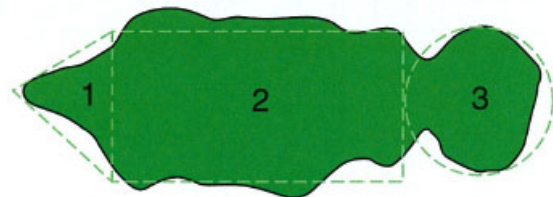
What is the area of a green that has a diameter of 15 meters?

$$\text{Area} = \frac{\pi \times (15 \text{ meters})^2}{4} = \frac{3.14 \times 2,025}{4}$$

$$= 177 \text{ square meters}$$

$$\begin{aligned} \text{Area in hectares} &= \frac{177 \text{ square meters}}{10,000 \text{ square meters per hectare}} \\ &= 0.018 \text{ hectares} \end{aligned}$$

## Irregular Areas



Any irregularly shaped turf area can usually be reduced to one or more geometric figures. The area of each figure is calculated and the areas are then added to obtain the total area.

### Example:

What is the total area of the Par-3 hole illustrated above?

The area can be broken into a triangle (area 1), a rectangle (area 2) and a circle (area 3). Then use the previously mentioned equations for determining areas to find the total area.

$$\text{Area 1} = \frac{15 \text{ meters} \times 20 \text{ meters}}{2} = 150 \text{ square meters}$$

$$\text{Area 2} = 15 \text{ meters} \times 150 \text{ meters} = 2,250 \text{ square meters}$$

$$\text{Area 3} = \frac{3.14 \times (20)^2}{4} = 314 \text{ square meters}$$

$$\text{Total Area} = 150 + 2,250 + 314 = 2,714 \text{ square meters}$$

$$= \frac{2,714 \text{ square meters}}{10,000 \text{ square meters per hectare}} = 0.27 \text{ hectares}$$