

Tips for Calculating Surface Area

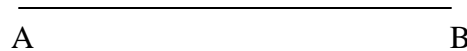
Area is defined in terms of square measures. The most commonly used area measurements are square feet and acres.

Areas of :	rectangle or square	=	length x width
	trapezoid	=	parallel sides $A + B / 2$ x height
	triangle	=	base x height / 2
	circle	=	radius (1/2 diameter) squared x 3.14
	oval	=	length x width x 0.8

The **offset method** is used to measure the area (square feet) of irregularly shaped areas. It reduces large areas to a series of smaller trapezoids that are equally spaced along a measured line. This method will determine the area to within 5%. The four steps in determining area by the offset method are as follows:

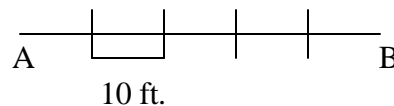
Step 1:

Determine the length line. This is the longest axis of the figure. Its endpoints should be labeled A and B.



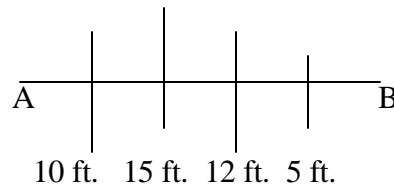
Step 2:

Mark offset lines at right angles to the length line. Choose how many offset lines to use so that they divide line AB into equal segments and define regions amenable to calculation. For example, if the length line is 40 feet, a logical distance between offset lines would be 10 feet, which would end up with 4 measurements. If the shape of the area is uniform, fewer offset lines are needed. However, if the shape is irregular, more offset lines are needed.



Step 3:

Measure the length of each offset line. These are measured from one edge of the area to the other.



Step 4:

Add up the lengths of all offset lines and multiply by the distance between offset lines on the length line.

$$10 \text{ ft.} + 15 \text{ ft.} + 12 \text{ ft.} + 5 \text{ ft.} = 32 \text{ ft.}$$

$$32 \text{ ft.} \times 10 \text{ ft.} = 320 \text{ square feet}$$

Measurements:

$$1 \text{ square inch (in.}^2\text{)} = 6.451626 \text{ cm}^2 = 0.0069444 \text{ ft}^2$$

$$1 \text{ square foot (ft}^2\text{)} = 144 \text{ in}^2 = 0.111 \text{ yd}^2 = 0.0929 \text{ m}^2$$

$$1 \text{ square yard (yd}^2\text{)} = 9 \text{ ft}^2 = 1,296 \text{ in}^2 = 0.83613 \text{ m}^2$$

$$1 \text{ hectare (ha)} = 2.471 \text{ acres}$$

$$1 \text{ acre} = 43,560 \text{ ft}^2 = 4,840 \text{ yd}^2 = 4,046.873 \text{ m}^2 = 0.404687 \text{ ha} = 0.0015625 \text{ mi}^2$$

(This information came from: The Mathematics of Turfgrass Maintenance by Christians and Agnew)