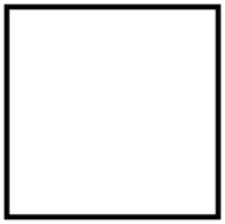
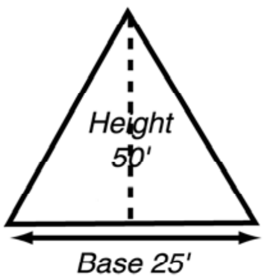
DETERMINING AREAS ON MY COURSE



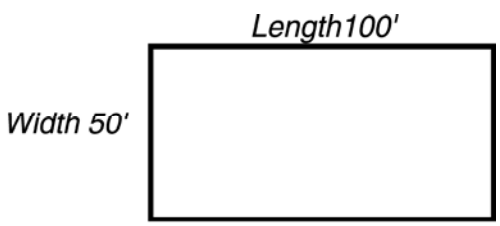
Length = 100 ft

Square = length x length
Area = 100 x 100 = 10 000 ft^2



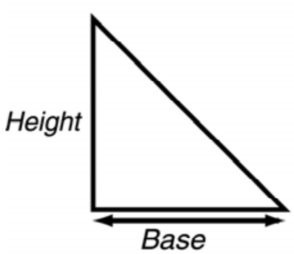
Triangle = $\frac{\text{base x height}}{2}$

Area = $\frac{25 \times 50}{2}$ = 625 ft^2

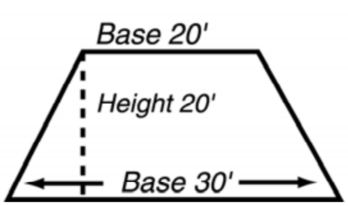


Rectangle = length x width
Area = 100 x 50 = 5 000 ft^2

Circle = 3.1416 x radius x radius
Area = 3.1416 x 50 x 50 = 7854 ft^2
or = 0.7854 x diametre x diametre
= 0.7854 x 100 x 100 = 7854 ft^2



Right triangle = $\frac{\text{base x height}}{2}$



Trapezoid = $\frac{\text{base + base}}{2}$ x height
Area = $\frac{20 + 30}{2}$ x 20 = 500 ft^2

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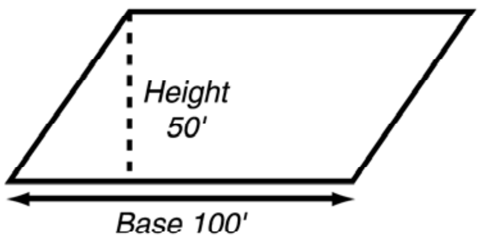
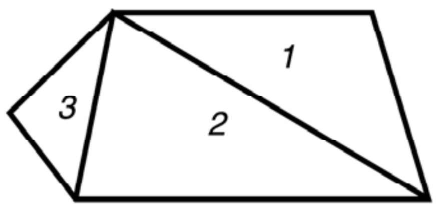
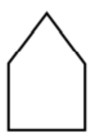


Parallelogram= base x height

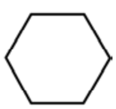
Area = 100 x 50 = 5 000 ft^2



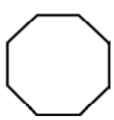
Divide into three triangles: determine the area of each triangle, then add the three areas.



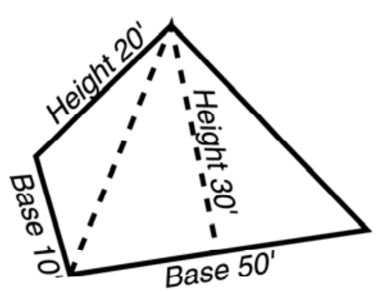
side 50'
Pentagon (5 equal sides)
Area = 50 x 50 x 1.72 = 4 300 ft^2



side 50'
Hexagon (6 equal sides)
Area = 50 x 50 x 2.598 = 6 495 ft^2



side 25'
Octogon (8 equal sides)
Area = 25 x 25 x 4.838 = 3 024 ft^2



No two sides are parallel.
Split into two triangles and add both areas.

$$A_1 = \frac{50 \times 30}{2} = 750\ ft^2$$

$$A_2 = \frac{10 \times 20}{2} = 100\ ft^2$$

Total area = 750 + 100 = 850 ft^2

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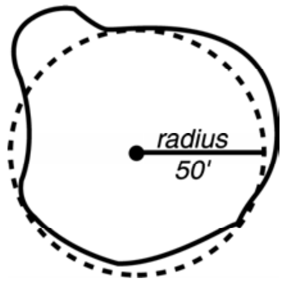
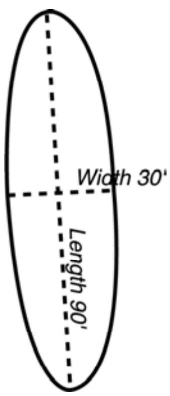
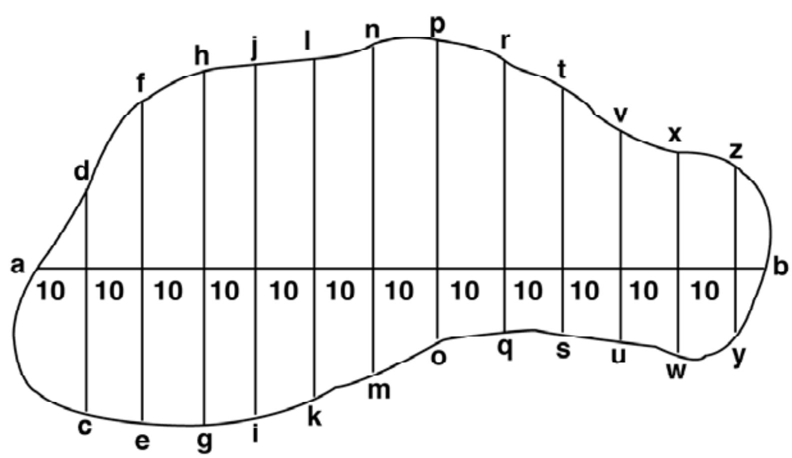


Area of an irregular shape:
it can be redrawn as a circle, thus area =
3. 1416 x 50 x 50 = 7 854 ft^2



Oval (egg shaped) area
Area = 0.8 x length x width
= 0.8 x 90 x 30 = 2 160 ft^2



55 feet y z = 30 feet

An irregularly shaped area:

1. Measure the longest horizontal distance ab (say 120 feet).
2. Measure the distance of the vertical lines at every 10 feet at right angles along the horizontal line (ab).

c d = 40 feet	o p = 50 feet
e f = 55 feet	q r = 45 feet
g h = 60 feet	s t = 40 feet
i j = 60 feet	u v = 35 feet
k l = 60 feet	w x = 30 feet
m n =	

Area = 10 (40+55+60+60+60+55+50+45+40+35+30+30)
Area = 5 600 ft^2

In case the piece of land is too irregular in shape, measure the vertical lines at a closer distance (say every 5 feet) along the horizontal line (ab) for more accurate results. As noticed in the figure, the vertical lines break down the area to a series of trapezoids where each one has a height of 10 feet (it can be less than 10 feet). The total number of ten-foot distances must be very close to the length of the horizontal line (ab).

A different method of determining the area of an irregularly shaped place is to measure the length (ab). Measure as many vertical lines cd, ef, gh, ij,...as possible. Add the lengths of all the vertical lines and divide by the number of vertical lines measured to have an average of one vertical line that will be considered as a width. Finally, the irregularly shaped place is considered as a rectangle.

Area = length a b x average width of vertical lines
Using the values of the example cited on the previous page:

$$= \frac{40 + 55 + 60 + 60 + 60 + 55 + 50 + 45 + 40 + 35 + 30 + 30}{12} = \frac{560}{12} = 46.67 \text{ feet}$$

Length of ab = 10 x 12 = 120 feet
Area = 46.67 x 120 = 5 600.4 ft^2

Note that the exact length of ab in the drawing is longer than 120 because there is a little length close to the point b that was not accounted for. This length is smaller than 10 feet because at the beginning we decided to measure the vertical lines at ten - foot increments. If we measure the vertical lines at five - foot increments, the value of the calculated area will be more accurate. Suppose the increments were measured every 5 feet and the last 4 feet were not measured thus the real area would be 46.67 x 124 = 5787 ft^2 when our practical measurements were 5600 ft^2 which is an error of 3.2% less than the real area. A measured value within plus or minus 3% accuracy from the real value is considered good.

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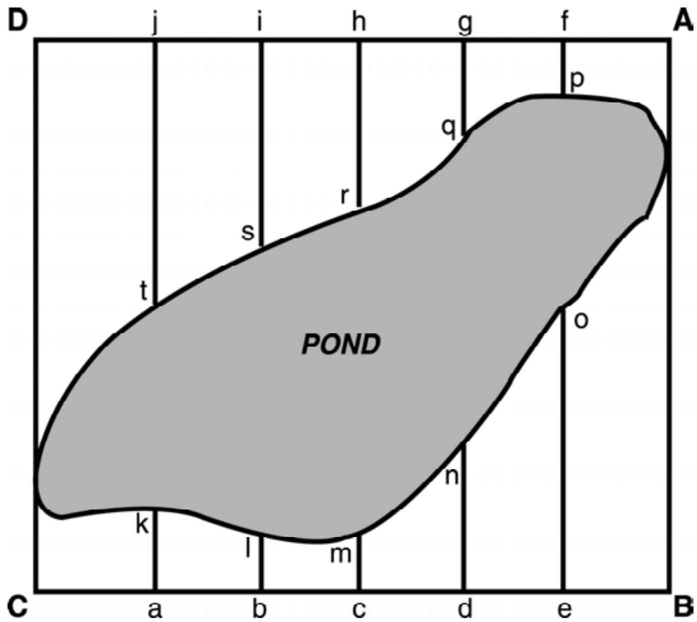


Area of a pond:

1. Put stakes at the four corners of the rectangle ABCD
2. Sides AB and CD touch the farthest points of the pond
3. Measure the length of AB = 60 feet which is equal to CD (rectangle)
4. Measure AD = 50 feet which is equal to BC
5. ABCD area = 60 x 50 = 3 000 ft^2
6. Establish vertical distances aj, bi, ch, dg, ef, at every 10 feet parallel to sides AB and CD
7. Measure the following lengths:

ak = 10 feet	tj = 25 feet
bl = 8 feet	si = 20 feet
cm = 8 feet	rh = 18 feet
dn = 15 feet	qg = 15 feet
eo = 25 feet	rf = 10 feet

8. Length of aj = AB = 60 feet,

thus kt = aj - ak - tj = 60 - 10 - 25 = 25 feet.
Similarly l s = 32 feet
m r = 34 feet
n q = 30 feet
o p = 25 feet

9. Total lengths of kt + ls+ mr + nq + op = 146 feet
10. Pond area = 146 x 10 = 1 460 ft^2

DETERMINING AREAS ON MY COURSE

Converting an area to a circle

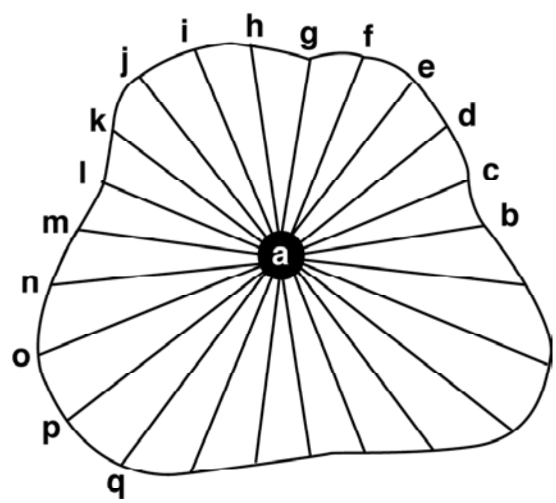
If a golf green is close to a circle, determination of its area can be done as follows:

1. Determine a central point from the middle of the green to all the edges.

2. Measure, at least 100 times in different places, the distance from the same central point to the edge such as ab, ac, ad, ae, af, ag, ah,...

3. Add all measures (ab + ac + ad...) and divide by the total number of measured distances to get an average radius of the circle.

Area of a circle =
radius x radius x 3.1416



Even if the green's area does not resemble
a circle, the above mentioned method of measurement is still valid.