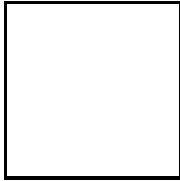


How to calculate area.

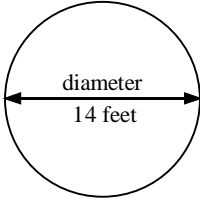
Square or rectangle
area = length X width



16 feet
24 feet

Area = L X W
= 16 ft. x 24 ft.
= 384 square feet

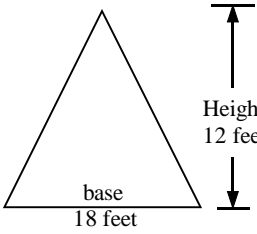
Circle
area = π X Radius² or π R²
 $\pi = 3.14$
Radius = 1/2 X Diameter



diameter
14 feet

area = π X Radius²
= 3.14 X 7 FT. X 7 Ft.
= 153.86 square feet

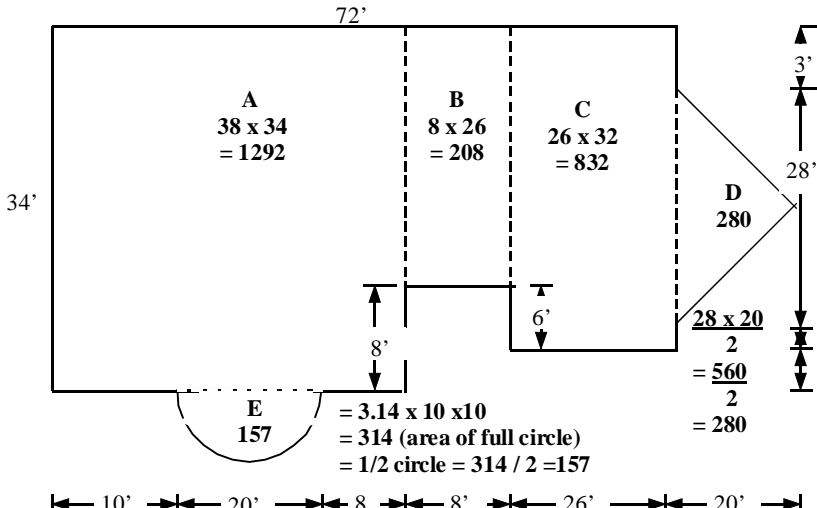
Triangle
Area = $\frac{\text{height X base}}{2}$
or
Area = 1/2 base X height



base
18 feet
Height
12 feet

Area = $\frac{\text{height X base}}{2}$
= $\frac{12 \text{ feet X } 18 \text{ feet}}{2}$
= $\frac{216 \text{ square feet}}{2}$
= 108 square feet

Calculating the square footage of a house (floor and ceiling area)



72'
34'
10'
20'
8'
8'
26'
20'

A
38 x 34
= 1292

B
8 x 26
= 208

C
26 x 32
= 832

D
280
 $\frac{28 \times 20}{2}$
= $\frac{560}{2}$
= 280

E
157
= 3.14 x 10 x 10
= 314 (area of full circle)
= 1/2 circle = 314 / 2 = 157

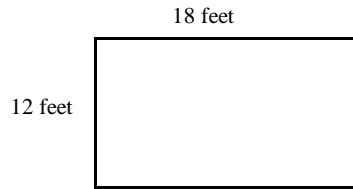
3'
28''
1
2

1. Section house into rectangles (dotted lines).
2. Calculate area within each rectangle (L X W)
3. Use formulas above to calculate area of triangle and half circle.
4. Add all areas together.
5.

A	1292
B	208
C	832
D	280
E	157
Total	2769 Square feet

Calculating the area of walls

The area of walls = Length X height (or perimeter X height)
 With a square, rectangular or triangular building simply add up
 the outside dimensions to determine the length (or perimeter).

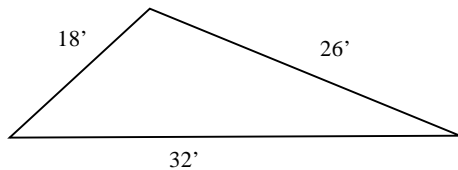


$$\text{Length or perimeter} = 18 + 12 + 18 + 12 = 60 \text{ feet}$$

$$\text{If the ceiling is 9 feet tall then:}$$

$$\text{Area of the wall} = 60 \text{ feet} \times 9 \text{ feet} = 540 \text{ square feet}$$

Calculating the area of triangular walls



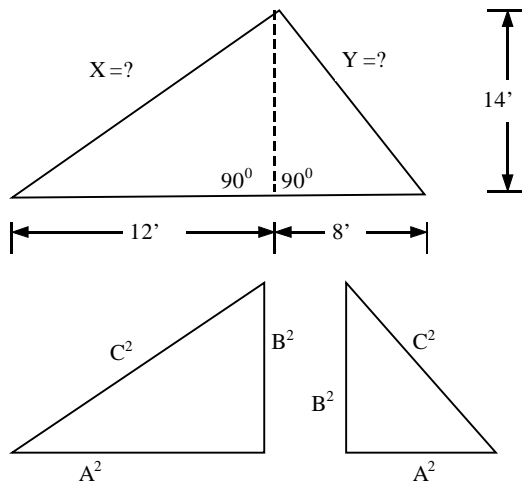
$$\text{Area} = \text{perimeter} \times \text{wall height}$$

$$\text{perimeter} = 18' + 26' + 32' = 76 \text{ feet}$$

$$\text{If walls are 10 feet high, then area} = \text{perimeter} \times \text{height}$$

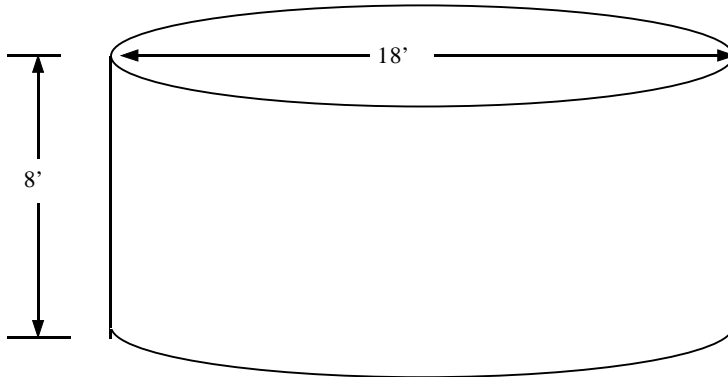
$$= 76' \times 10' = 760 \text{ square feet}$$

Sometimes we are not given all the sides of a triangle. When this happens, we must perform the following:



1. Draw a dotted line from the triangle apex to the base, thus forming two right triangles as shown below (a right triangle has one 90° angle). This dotted line is 14'.
2. In our example to the left, sides X and Y are called hypotenuses. If we know the X and Y lengths then we can determine the total perimeter around the triangle.
3. The formula for determining the hypotenuse is $C^2 = A^2 + B^2$. **In layman's terms, The formula is hypotenuse = the square root of $A^2 + B^2$**
4. On your calculator enter $12' \times 12' = 144 \text{ sq. ft}$
 $+ 14' \times 14' = 198 \text{ sq. ft}$
 Total $A^2 + B^2 = 342 \text{ sq. ft}$
 Enter 342, then press the square root symbol ($\sqrt{\quad}$). The resulting answer is the X dimension (18.49').
5. Calculate the hypotenuse of the other triangle the same way: $(8' \times 8') + (14' \times 14') = 260 \text{ sq. ft}$. The square root of 260 is 16.12'. Therefore $Y = 16.12'$.
6. The total linear feet around our triangle is $18.49' + 16.12' + 12' + 8' = 54.61 \text{ feet}$.
7. The total square footage of our 10 foot high triangular wall is $54.61' \times 10' = 546.1 \text{ sq. ft}$.

Calculating the area of circular walls



Earlier we learned how to calculate the area of a circle using the formula, $\text{area} = \pi \times \text{Radius}^2$
We now need to learn a new formula that calculates the circumference of a circle. The circumference is the same as the perimeter of a rectangular wall. If we know the circumference then we can say the area of a circular wall = circumference X height.

$$\text{Circumference} = 2 \times \pi \times \text{Radius} \text{ OR } 2\pi R$$

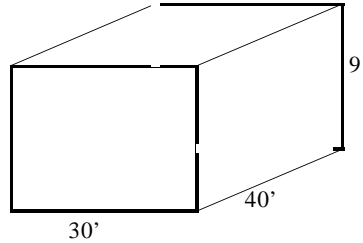
Therefore, the area of the above wall is calculated as follows:

$$\begin{aligned} \text{STEP 1. Circumference} &= 2 \times 3.14 \times 9' \\ &= 56.52 \end{aligned}$$

$$\begin{aligned} \text{STEP 2. Wall area} &= 56.52 \times 8' \\ &= 452.16 \text{ Sq. ft.} \end{aligned}$$

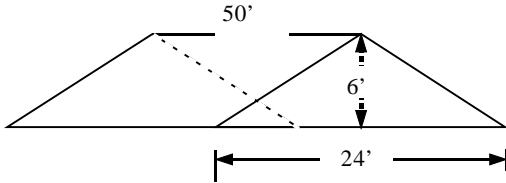
Calculating volume

Volume of square or rectangular shaped building = area X height, or length X



$$\begin{aligned}\text{Volume} &= \text{length X width x height} \\ &= 30' \text{ X } 40' \text{ X } 9' \\ &= 10,800 \text{ cubic feet}\end{aligned}$$

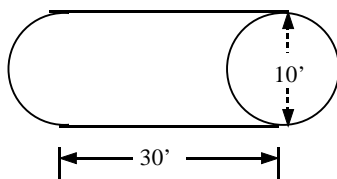
Volume of a triangular building = area of triangle X length or height



$$\begin{aligned}\text{Step 1. Area of triangle} &= \frac{\text{length X height}}{2} \\ &= \frac{24' \text{ X } 6'}{2} \\ &= 72 \text{ sq. ft.}\end{aligned}$$

$$\begin{aligned}\text{Step 2. Volume of triangle} &= \text{area X length} \\ &= 72 \text{ sq. ft. X } 50' \\ &= 3600 \text{ cubic feet}\end{aligned}$$

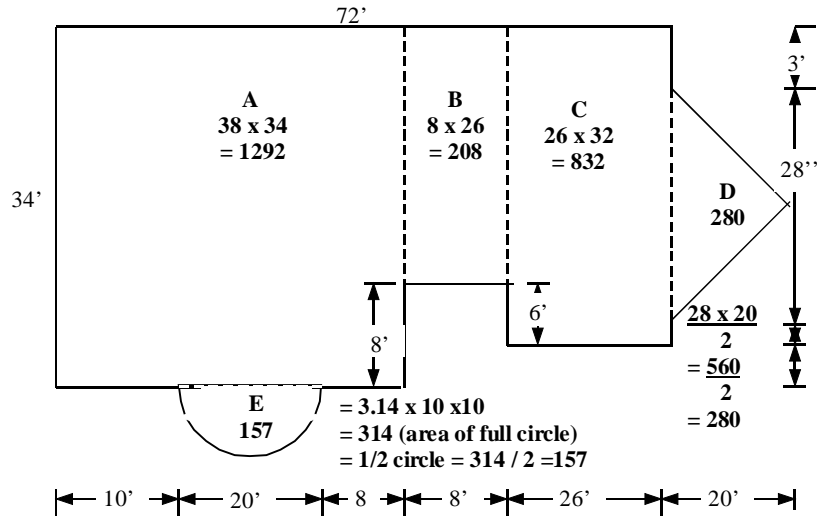
Volume of a cylinder = Area of circle X length of cylinder



$$\begin{aligned}\text{Step 1. Area of circle} &= \pi \text{ X Radius}^2 \text{ or } \pi R^2 \\ &= 3.14 \text{ X } (5' \text{ X } 5') \\ &= 3.14 \text{ X } 25 \text{ square feet} \\ &= 78.5 \text{ square feet}\end{aligned}$$

$$\begin{aligned}\text{Step 2. Volume of cylinder} &= \text{area of circle X length of cylinder} \\ &= 78.5 \text{ square feet X } 30' \\ &= 2355 \text{ cubic feet}\end{aligned}$$

Volume of house with 9 foot ceilings



Volume = area X height

Step 1. Determine square footage (area) of building

Volume A = 1292 sq. ft.

Volume B = 208 sq. ft.

Volume C = 832 sq. ft.

Volume D = 280 sq. ft.

Volume E = 157 sq. ft.

Total Area = 2769 sq. ft.

Step 2. Determine volume

Volume = area X height

= 2769 sq. ft. X 9'

= 24,921 cubic feet