



Basic Math & ACH

Practice:

A house measures 32 by 48 with an average ceiling height of 10 feet. There are eight windows that measure 32 inches by 48 inches. There are two doors that measure 36 inches by 80 inches. The blower door number is 800 cfm@50.

How many square inches are in one square foot? _____ (L x W: 12 x 12 = **144**)

What is the area of the floor in square feet? _____ (L x W: 32 x 48 = **1536**)

What is the perimeter of the building in linear feet? _____ (A + B + C + D...etc.: 32 + 48 + 32 + 48 = **160**)

What is the gross area of the walls in square feet? _____ (L x W or Perimeter x Height: 160 x 10 = **1600**)

What is the total area of the windows and doors in square feet? _____ L x W – converted to square feet: windows – 32" x 48" x 8 = 12,288 sq.in. ÷ 144 = **85.33** sq.ft. / doors – 36" x 80" x 2 = 5,760 sq.in. ÷ 144 = **40** sq. ft. / Total combined = **125** sq.ft. - rounded)

What is the net area of the walls in square feet? _____ (Gross wall area – openings: 1600 – 125 = **1475**)

What is the volume of the building in cubic feet? _____ (L x W x H: 32 x 48 x 10 = **15,360**)

What is the ACH50 for this building? _____ (CFM50 x 60 ÷ Volume: 800 x 60 ÷ 15,360 = **3**)

Additionally:

What is the cross-sectional area of a 6" round air duct in square inches? _____ ($\pi \times R^2$ or Pi x Radius squared: 3.14 x (3x3) 9 = **28.26**)

What is the area of a triangle with an 8" base and 6" height in square inches? _____ (B x H ÷ 2: 8 x 6 ÷ 2 = **24**)

What is the length, in feet, of the hypotenuse (long side) of a right triangle if the base is 8' and the height is 6'? _____ (A² + B² = C²: (8x8) 64 + 36 (6x6) = 100. The root square of 100 = **10**)

What is the area, in square feet, of a simple 5/12 pitch gable roof, with no eaves, on a house that measures 30' wide x 40' long? _____ (½ of the width = 15', this base and a 5/12 pitch = 6.25 feet for the height of the right triangle (5" x 15 = 75" or 6.25'). The hypotenuse is then calculated: (15x15) 225 + 39 (6.25x6.25) = 264; the root square of 264 = 16.25. Now it is two rectangles: 16.25 x 40 x 2 = **1300** sq.ft. of roof)