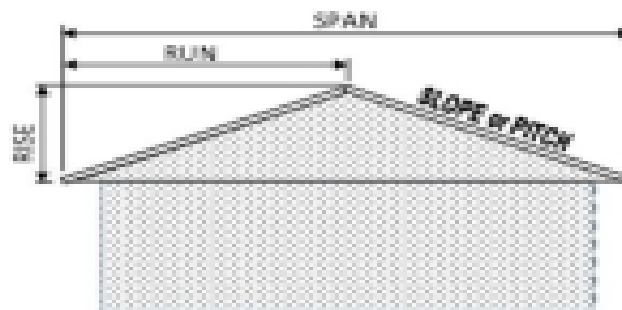


Roof Slope and Bevel Ratio

The slope of a roof is determined the same way as the slope of a line: by taking a ratio of the rise (vertical height) to the run (horizontal length). For roofing, these measurements are always converted to inches long before calculating the slope. You may also encounter the slope (or pitch) of a roof given as a vertical rise relative to a horizontal twelve inch (12") length. The notations in the table below all describe the same slope. The figure below and to the right shows the rise and run of a roof. Note that the span is the length of the entire roof. For a symmetrical roof, the run is 1/2 of the span.

4 in 12
4 on 12
4:12
4/12
4" : 12"
$\frac{12}{4}$
$\frac{12}{4}$



The bevel ratio is the slope expressed in a ratio format, always in the order of rise : run (e.g., 4:12).

We can use a known bevel ratio to calculate the unknown rise or run of a roof. For instance, if the dimensions of the building change and the angle or slope of the roof must remain the same, the roof dimensions would need to be recalculated. When calculating a bevel ratio, the units of the rise and run must be the same. You may also be asked to express the bevel ratio of a roof (or road or any elevated surface) with a base of 1 – which simply means that the rise should be 1.

Example 1: Calculate the bevel ratio of a roof with a rise of 3'-6" and a span of 14' (the roof is the same shape as the figure above).

Solution: The first step is to get both measurements in the same units.

In this case, feet will be the easiest to work with. 3'-6" is 3.5 feet. Since we have the span, we must divide by 2 to get the run: $14 \div 2 = 7$ feet.

Now we take the ratio of rise to run:

$$3.5' : 7' = 1:2 \text{ bevel ratio}$$