

Exercise 10-1

Roof Framing Computations

Name _____ Date _____ Score _____

Objectives

- To practice calculating rafter length from runs and rises.
- To study the difference between the terms "rise" and "run."

Procedure

Using the formulas and the figures provided, complete the chart on the following page.

$$\text{Pitch} = \text{Rise} \div \text{Span} \quad \text{OR} \quad \text{Pitch} = \text{Rise} \div (2 \times \text{Run})$$

$$\text{Rise} = \text{Pitch} \times \text{Span} \quad \text{OR} \quad \text{Rise} = \text{Pitch} \times (2 \times \text{Run})$$

$$\text{Run} = \text{Span} \div 2$$

$$\text{Span} = 2 \times \text{Run}$$

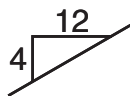
$$\text{Inches of rise per foot of run} = \text{Total inches of rise} \div \text{Total feet of run}$$

Line length procedure (rafter length):

1. Find the inches of rise per foot of run. This is the unit rise.
2. The unit rise is used to locate the corresponding number on the rafter square table.
3. Find the number under the rafter square table number that will represent the line length per foot of run. Multiply this number times the total feet of run.

Cut: The cut is the same thing as the inches of rise per foot of run but expressed in a different way.

Example: If you had a roof with 4" of rise per foot of run, the cut would be 4/12. It may also be expressed as the following symbol on a drawing.



Total Rafter Length: This is found by taking the total line length, subtracting one half the thickness of the ridge board, then adding on the amount of overhang you want to use. (If you want 1' of overhang, you add one unit of line length to the rafter length, rather than adding 12".)

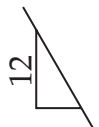
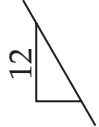
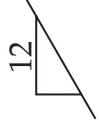




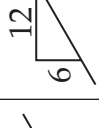
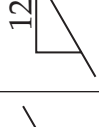
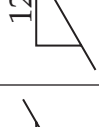
Example: Calculate total rafter length if line length is 127.58", ridge thickness is 1 1/2", and unit length for the 1' overhand is 12.65".

1. Subtract one-half ridge thickness from the line length:
 $127.58" - 0.75" = 126.83"$
2. Add line length for overhang:
 $126.83" + 12.65" = 139.48"$

Exercise 10-1 (continued) Roof Framing Computations

Name _____ Date _____ Score _____

(Take decimals to two places, e.g. 115.67")

Specs.	1	2	3	4	5	6	7	8	9	10
Rise	3'		5'		6'			3'	10'	
Run		7'		16'	18'		8'			12'
Span	24		40'		36'	12'			48'	
Pitch		1/2		1/4						1/6
Inches of rise per foot of run										
Cut										
Line length per foot of run	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Total line length in inches	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Total rafter length w/ 1 1/2" ridge and 1' overhang	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.