THE SPEED SQUARE

SWANSON TOOL CO., Inc. ™

"SPEED LINE"

SWANSON'S BOOK OF RAFTER LENGTHS AND ROOF CONSTRUCTION

AMERICAN HOME SERVICE CO.
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Frame Your Roofs as Easily
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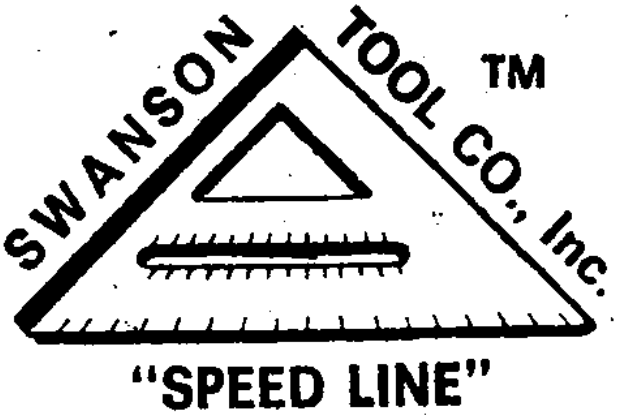
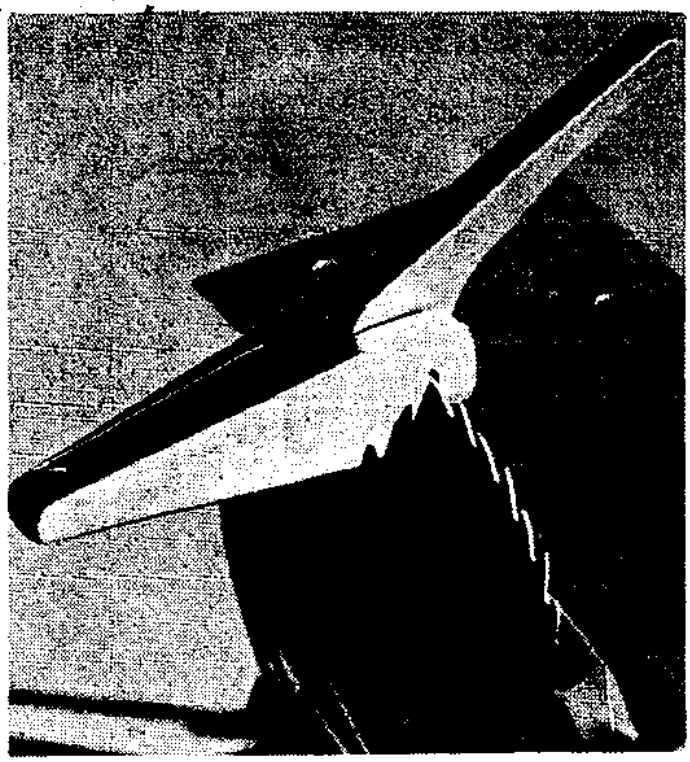
The SWANSON SPEED™ LINE

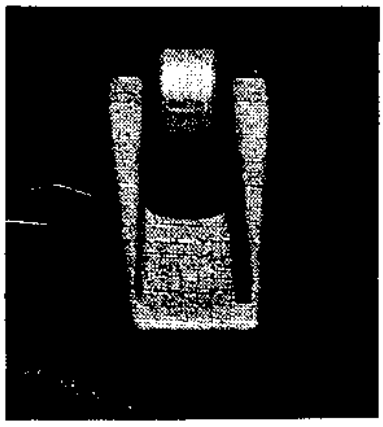


SWANSON TOOL CO., INC.

P.O. Box 434 • Oak Lawn, Ill. 60453

Phone: (312) 599-9029





ITEM #00103

THE SWANSON SAW SET . . . .

in just a few minutes time will reset the teeth on any general use type combination blade (approx. ⅜" or more point to point of tooth). Wide handle holds blade stiff, removing any spring from blade as you set tooth. Narrow handle is placed over tooth to be set (as shown above) and pressed down against adjusting screw to the amount of set desired. Wide handle has a larger slot for heavy table saw blades.

Made of strong aluminum alloy. Saves time and money. A practical "on the job" saw set at a reasonable price. Has instructions for setting and sharpening. (File not included).

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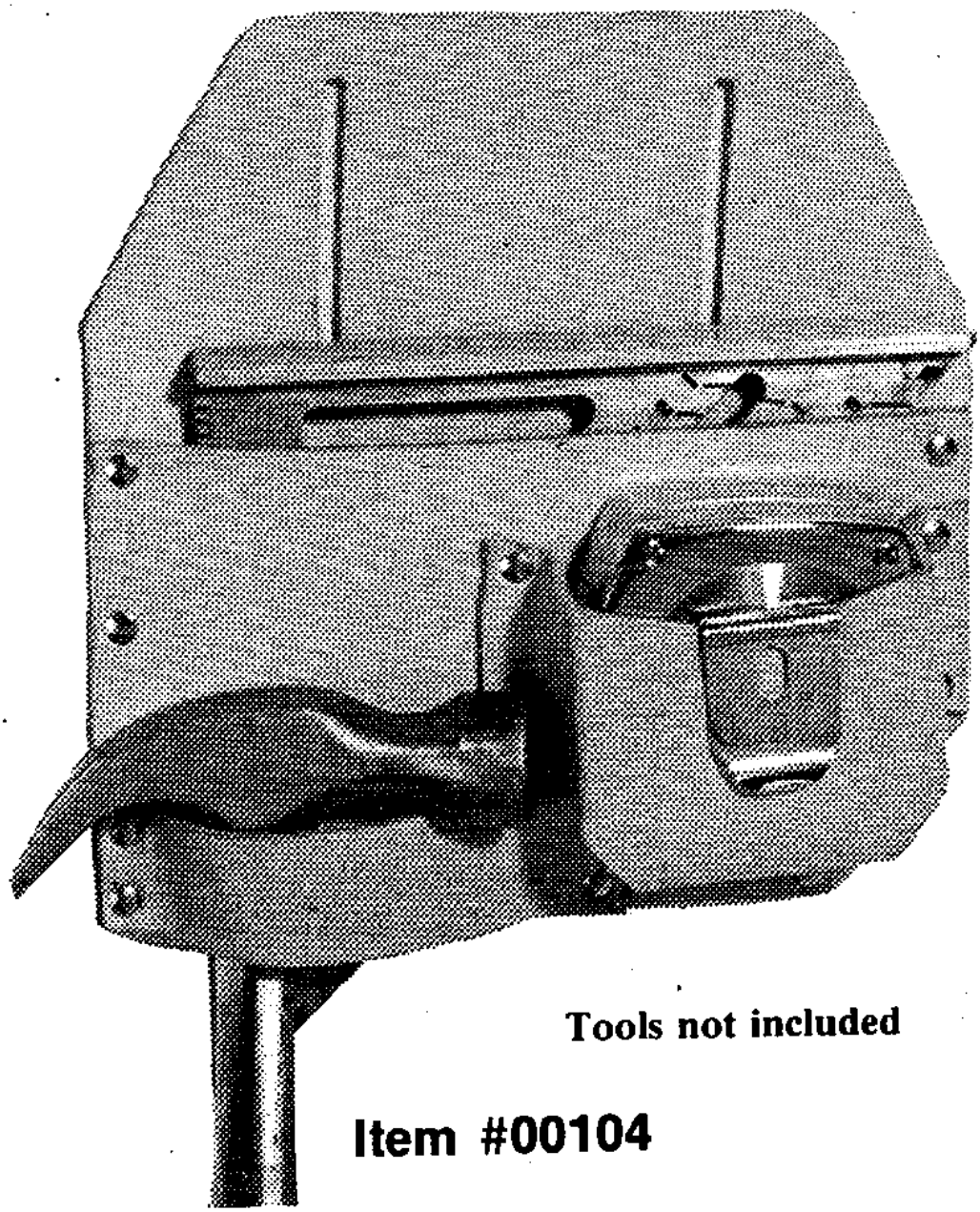

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- Heavy 8 oz. Top Grain Cowhide Leather - All capped rivets.
- A pouch for the tools you always need, at your side.
- Pocket for Swanson Speed Square.
- Large hammer loop.
- Tape pocket for 25′ x 1″ tape.
- Ideal for home projects and tradesman on the job.

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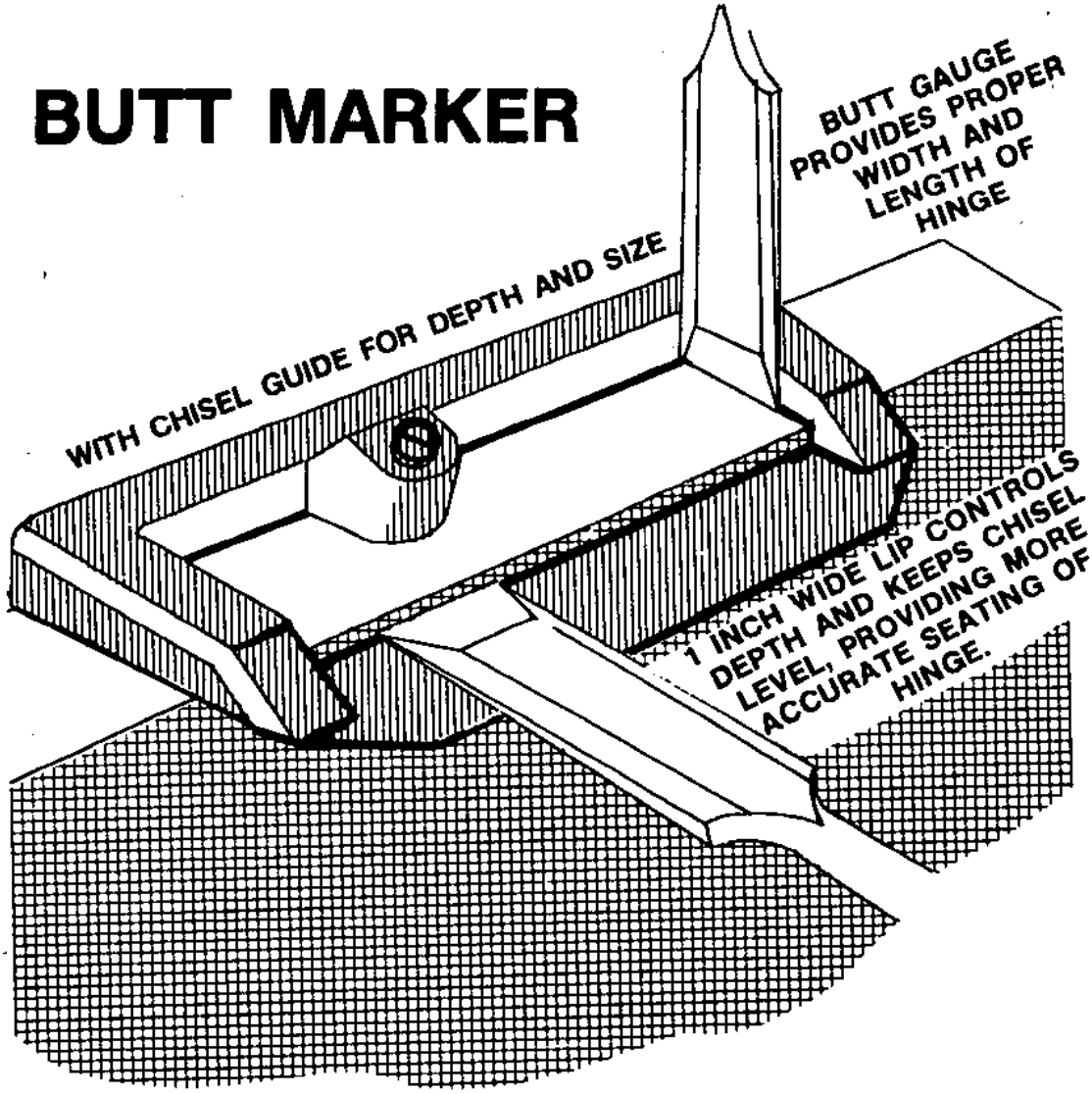

Provides accurate mortise in doors and jambs. Available for 3½" and 4" Hinge size. Instructions for hanging door included.

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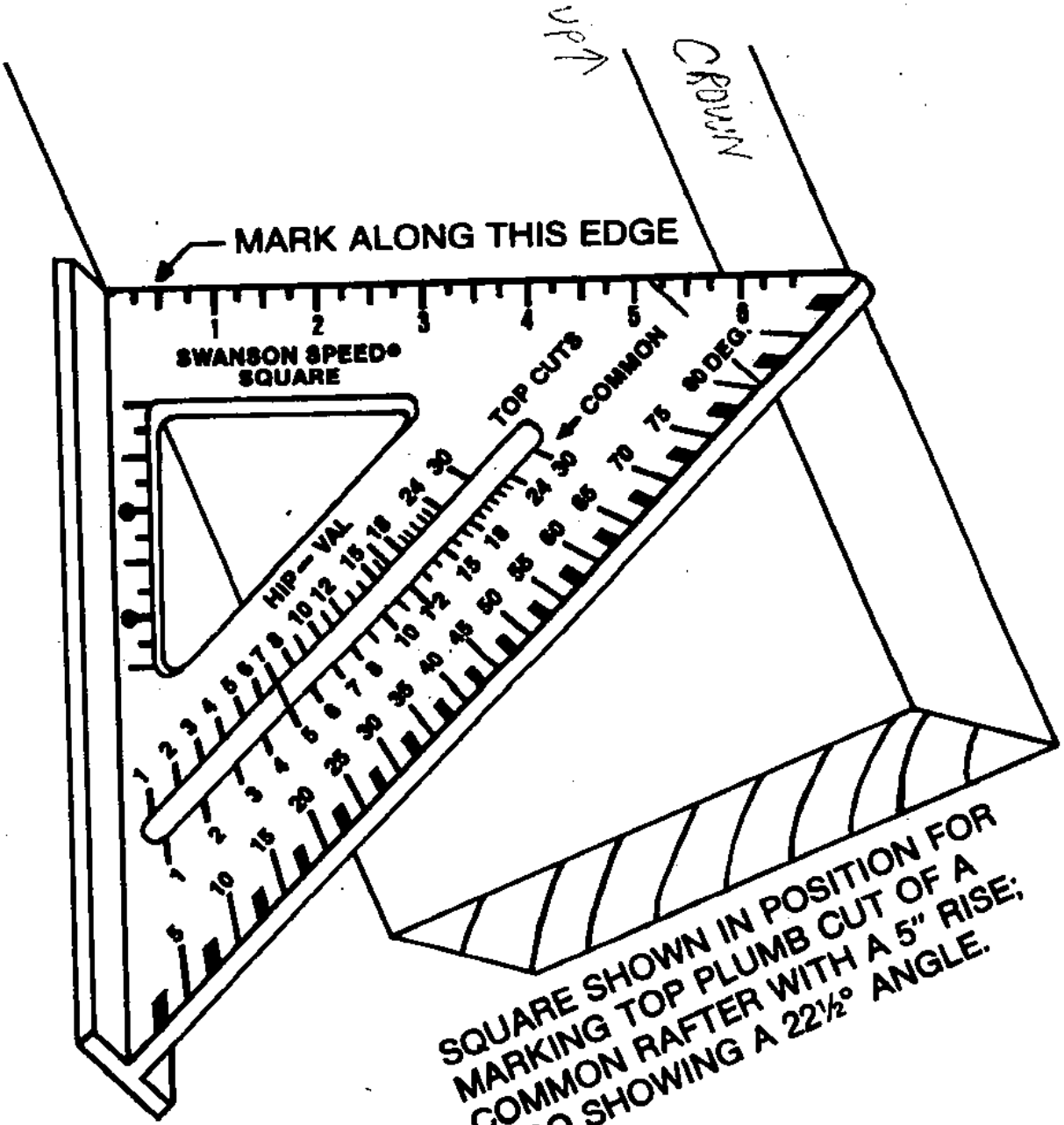
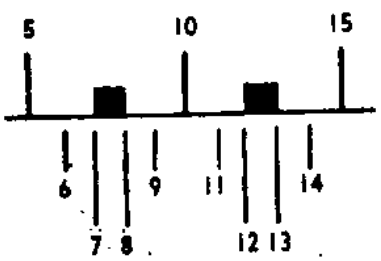


SQUARE SHOWN IN POSITION FOR MARKING TOP PLUMB CUT OF A COMMON RAFTER WITH A 5" RISE; ALSO SHOWING A 22½° ANGLE.

ENLARGED SECTION OF DEGREE SCALE



Note: Each heavy block line is 1° wide. Each space is 2° wide.

THE SCALE, 0-90 DEGREES, ACROSS BOTTOM (LONG LEG) OF SQUARE ALLOWS USER TO MARK AND MEASURE HIS WORK IN DEGREES. THE LONG LINES WITH A HEAVY BLOCK LINE BETWEEN MAKES IT MUCH EASIER FOR THE EYE TO PICK OUT A LOCATION ON THE SCALE.

THE "ONE NUMBER" METHOD FOR ANY PITCHED ROOF

The one number method developed by the Swanson Tool Co. simplifies roof framing to where roofs are really framed as "easily as your studdings or joists."

Following is a brief description of the various rafters, how to get the different cuts, where to measure from, what is meant by "run" and "rise," information about the hip and valley rafter, etc.

This book has been rewritten with the use of more pictures in the hope it will be of greater benefit to those who are not as familiar with roof construction as the tradesman. Good planning will save time and material.

NOW WITH FULL 90 DEGREE SCALE

The square has been redesigned with the addition of a full 90 degree scale, which will enable the user to mark any angle in degrees, as well as all the angles represented in "inch rise per foot run." You can easily convert degrees to inch rise or vice versa at a glance. The square makes an excellent guide for the electric saw to run against and is very handy for trim work.

COMMON RAFTER: One running at right angles (90°) from plate to ridge. The common rafter will form the diagonal leg (hypothenuse) of a 90° triangle, with the rise and run forming the 90° angle of the triangle (Fig. 1).

Fig. 1 also shows correct points from which to measure. Study them and remember the picture when you are on the job. Where the arrows show |⧫ Rafter Length ⧫|, these are the lines to measure from. When your lumber is not straight, always put the crown or high side up when laying out *any* rafter. When laying out rafter as shown in Fig. 1 (lets assume 5" rise), start at top end of rafter. Lay square on face of rafter, with "T" bar of square down over the edge of rafter. Pivot square to where number 5 on common scale lines up with same edge of rafter as pivot point. Keep pivot point tight against edge of rafter. Start your mark at pivot point, marking along top edge of square. See drawing in front of book. This gives the *top plumb cut*, to fit against ridge.

Measure the rafter length along top edge of rafter. Mark another plumb cut same as above. This line represents outside wall of the building. (The same point from which you measured the width of the building). Add whatever length you want for a tail or eave to the rafter lengths given in the table in back of book. Mark at end of tail on rafter is plumb

cut, same as one at top end of rafter (Fig. 1). The tails of the rafters may be cut on the ground, or wait until rafters are all in place and mark the ends to a line and cut—whatever is the easiest. To get the Bottom or Heel cut see Fig. 2.

VALLEY RAFTER: One running diagonally from the plate to the ridge at the intersection of gable extension with main roof (Fig. 7).

HIP RAFTER: One running diagonally from the plate to the ridge (Fig. 7).

Since both hip and valley rafters run at a 45° angle to the common rafter, they both represent the diagonal or hypothenuse of a right triangle; the three sides being the hip, plate and common rafter, or the valley, ridge and common rafter. Therefore, the cuts and lengths apply equally to hip and valley rafters (Fig. 3).

You will notice the square has a separate Hip-Val Scale which must be used for either of these two rafters. But *always* use the *same number* on Hip-Val scale as you used on the common rafter scale—the number representing *inch rise.* The reason for the separate Hip-Val scale is that the hip and valley rafters run at 45° to the common rafter, and therefore must be longer. In Fig. 3, the hip rafter has a horizontal run of 17" to rise 12", while the

common rafter rises 12" in only 12" of horizontal run. This requires a different angle for the plumb cuts. In Fig. 4, square is held on rafter and pivoted in the same manner as with a common rafter, but using the Hip-Val scale. If building is out of square, one hip will be cut a little shorter, depending on how great the error is. Keep longer corner at top end of hip up even with top of ridge. Keep ridge and hips well propped up until roof boards are nailed. Watch that you don't put a bow in ridge or hip while nailing other rafters to them.

To find intersection points of center of hips on ridge, leave ridge about a foot too long at point where both hips intersect the ridge. Take a regular length common rafter (such as used on main roof). Set bottom cut over edge of plate and in line with ridge. Make sure your walls are straight. Place top end of common rafter along side of the ridge, bringing *top point* of common even with top of ridge (Fig. 5). Mark across top of ridge at this point. This mark is the center line of the two intersecting hips. The common rafter used to get this intersection point would be placed in the same position as the one in Fig. 7 that comes in line with the ridge and runs underneath the little dormer on the 20'0" wall side. This way you know the rise of the hips will be the same as the rise of the common rafter

on main roof. Leave the bottom ends of the hips (eave end) a little short so they will not interfere with lining up the facia boards at the corner.

JACK RAFTERS: One which does not extend from plate to ridge. *Hip Jack* — one running from plate to hip at 90° to plate. *Valley Jack* — one running from ridge to valley at 90° to ridge. *Cripple Jack* — one which neither touches the ridge nor plate, but runs from a hip rafter to a valley rafter at 90° to the ridge (Fig. 7).

The rise and run of a jack rafter are the same as that of a *common* rafter. When marking jacks use the *common* rafter scale and same number (inch rise). Where rafter rests against hip or valley, mark plumb cut, then cut at 45° angle along this mark. This will give both plumb cut and side cut (Fig. 4). When resting on ridge or plate, lay out the same as for the common rafters. For cripple jacks, mark plumb cuts on both ends and saw at 45° as above.

When measuring the length of the jack rafter, measure from longest corner (plumb cut on 45°) to other plumb cut mark, along *Top Side* (same as shown in Fig. 4 for hip rafter). Cripples are measured from long point to long point diagonally along top edge. Measuring to the long point (Fig. 4) will compen-

sate for ½ of the ridge thickness (or for jacks, ½ of valley or hip thickness). There is no problem in laying out these angles on the rafters as long as you keep in mind which side of the hip (or whatever) you want the rafter to fit against. Usually a carpenter will space the ceiling joist from an outside wall and working to a 48" center. This gives proper spacing for dry wall or panelling or whatever is used. Proper spacing of ceiling joist will aid in roof construction. Measure shortest jack first (usually running next to a ceiling joist), from plate to hip rafter. The difference in length of the rest of the jacks is taken from chart. Set each rafter along side ceiling joist and spike well. The ceiling joist then ties the roof together.

Figure the rafter material lengths so you can cut a long and short jack rafter from each piece. When you have cut your shortest jack, the angle of the long end will then fit on the other side of the hip. Do this all the way up the hip, always leaving the cut off end for the other side. If lumber has crown in it, put crown *up* on *longest* cut off piece.

In some cases a carpenter will build the valley on top of the main roof, not using a valley rafter. This of course would be the easiest way on any remodeling job, room addition, etc. It saves cutting into and weakening the main roof. Mark location of valley on

roof boards, 45° to common rafters (See Dormer, Fig. 7). Set long point of bottom end of rafter even with this line ("G" of Fig. 7). The top cut of the rafter is the same as top cut of common. Bottom end is a horizontal cut, same as Bottom or Heel cut that fits on top of plate, and is marked in same way, but extends all the way across rafter (Fig. 2). Then tilt the base of your saw to the *same angle* as the roof on which the bottom end of the rafter will rest. I.E., if rafter end is to fit on a roof with 6" rise, you would tilt the base of saw to an angle of 26½° (6" rise) and cut along horizontal line. With saw set at this angle you will see that it fits over the pointed end of top of common rafter, because this would also be a 26½° (6" rise) angle. Save the cut off ends for the other side.

Fig. 7 shows a roof as is sometimes used over a door. See "H." To get the pointed end cut, the Square is held in position for the plumb cut of the *flat* roof. Then a line running from the pivot corner of the Square thru the number representing the rise of the Main Roof is the cut wanted.

PLYWOOD ROOF SHEATHING

When using plywood for a roof sheathing it is best to do the angle cutting on the horses as follows: from the far left hand corner of a 4 x 8 foot sheet, measure to the right the

distance given for the pitch wanted (measurements given in following chart). From this point draw a line back to the near left hand corner. These measurements are for a perfectly square roof. Better check the first piece cut for any changes required.

For roofs of 6" pitch or steeper, the bevel can be cut with an electric saw that tilts to 45°. For a flatter pitched roof it is best to leave the saw set at 90° and use a valley strip made as follows: Scribe a line ¼" from the right hand edge of a 2" piece. With the saw tilted, rip at this line. The strip should be the thickness of the roof boards at the thick edge.

Inch Rise per foot run	Measure from corner of Plywood
2"	3' 11⅜"
2½"	3' 11"
3"	3' 10⅝"
3½"	3' 10⅛"
4"	3' 9⅝"
4½"	3' 9"
5"	3' 8⅜"
5½"	3' 7⅝"
6"	3' 6⅞"
7"	3' 5⅜"
8"	3' 3⅞"
9"	3' 2⅜"
10"	3' ⅞"
11"	2' 11⅜"
12"	2' 9⅞"

FOR UNEVEN PITCHED ROOFS

If your roof has no hips or valleys and you have more than one pitch, cut each section separately using the number representing the pitch of that section.

For instance, if the front section is 8" rise and 12' run, you would use number 8 and find your rafter lengths under 24' width. Then we'll say the rear is 3" rise and 16' run. Use number 3 on the Square, and 32' building width for your length. The top cut to fit against the ridge is plumb for both sections. Your rear plate would be 4' higher.

DETERMINING THE RISE OF A ROOF

Assume your building has an 18' wide span and you want an 8' rise. Expressed as an equation:

$$\text{Inch rise per foot run} = \frac{\text{Rise x 12}}{\text{Run}}$$

The rise here is 8' and the run is 9' (½ of span) so: $\frac{8 \times 12}{9} = \frac{96}{9}$ or 10⅔" rise. Round this off to the closest inch (in this case 11"), which will increase the rise by ⅓" x 9' or 3" for this building. Now you can look in rafter table under 18' building width and 11" rise and your rafter is 12' 2½". This does not include any overhang. If exact length is needed see Fig. 1. (Also Page 12, Note.)

A "Full" pitch roof is one having a 24" rise for 12" run. Following is a Table of various pitches. Pitch equals rise divided by span; being the proportion the rise bears to the span.

Inch Run	Inch Rise	Pitch	
12"	22	11/12	
12"	20	5/6	
12"	18	3/4	
12"	16	2/3	
12"	14	7/12	
12"	12	1/2	— meaning roof
12"	10	5/12	rises a distance
12"	8	1/3	equal to 1/2 of
12"	6	1/4	building width.
12"	4	1/6	
12"	2	1/12	

USING THE RAFTER LENGTH TABLES

In the following pages are tables giving the lengths of any common, hip or valley rafter for any pitch up to a 24" rise, and for building widths up to 40 feet. (See Page 12.)

Fig. 7 gives one example of the use of these tables. The main building is 20' wide x 30' long with a 7" rise. Thus, the hip rafters are 15' 3⅝" long, and the common rafters 11' 7". The 15' x 15' addition, hips and valleys are 11' 5⅝" long and the commons 8' 8⅜". For the 10' Gable Dormer on top of the roof boards, the longest rafters are 5' 9½".

A "width in inches" table is found in back of book which gives the amount to add for inches in case the width does not measure out in even feet. Simply add the length given for the inches in relation to the rise, to the length given for the even foot tables. Lengths given do not include eave projection.

It is best to use a steel tape in measuring the width of building, measuring from outside to outside of plate upon which rafters will rest, or if boarding extends to top of plate measure to outside of boards. *If a ridge board is used, deduct the thickness of same from building width.*

For building widths greater than is given in this book, take any two widths which when added together equal the width wanted. Find the lengths for these two widths and add them together; for instance for 49' width take width of 20 and 29 and add together.

NOTE: Lengths of rafters for pitches 2½, 3½, 4½, 5½: Use lower pitch then add ½ of difference to next higher pitch.

THE DEGREE SCALE

The same pivoting method used to determine rafter cuts is used with the degree scale. By remembering that the square forms a 45°

right triangle, it can be used to measure any angle with the use of the degree scale.

A study of the following diagrams will show the principals used. These principals can be applied in different ways to meet various problems.

To mark degrees on a flat surface see Figs. 8 and 9.

To find degrees in an upright or vertical position, Fig. 10 shows two methods by which a plumb line can be used on the square. Fig. 11 gives illustrations of the use of a plumb line on the square.

Fig. 11A — With plumb line AB set on 45° mark, the square is now positioned so that the bottom (long side) of square is running level, 90° to plumb line.

Fig. 11B — By swinging the square up against line XY, the plumb line has shifted 15°. Thus the unknown angle in 11A was 15°, with angle ABX = 60°. This same 15° reading also indicates bottom edge of square is setting at a 15° incline.

In looking at Fig. 11A and B, it is possible that sometimes the plumb line will not fall from pivot point to a point on the degree scale due to the position of line XY. In this case, rather than setting the *edge* of the square to

line XY, simply turn the square over and let line XY run *behind* the square. Line XY will then run from pivot point to some point on the degree scale; such as shown in Fig. 11C. Now set plumb line AB on square. The number of degrees on scale between plumb line and angle line indicates measured angle.

RAFTER LENGTHS FOR 1" - 30" ROOF RISE

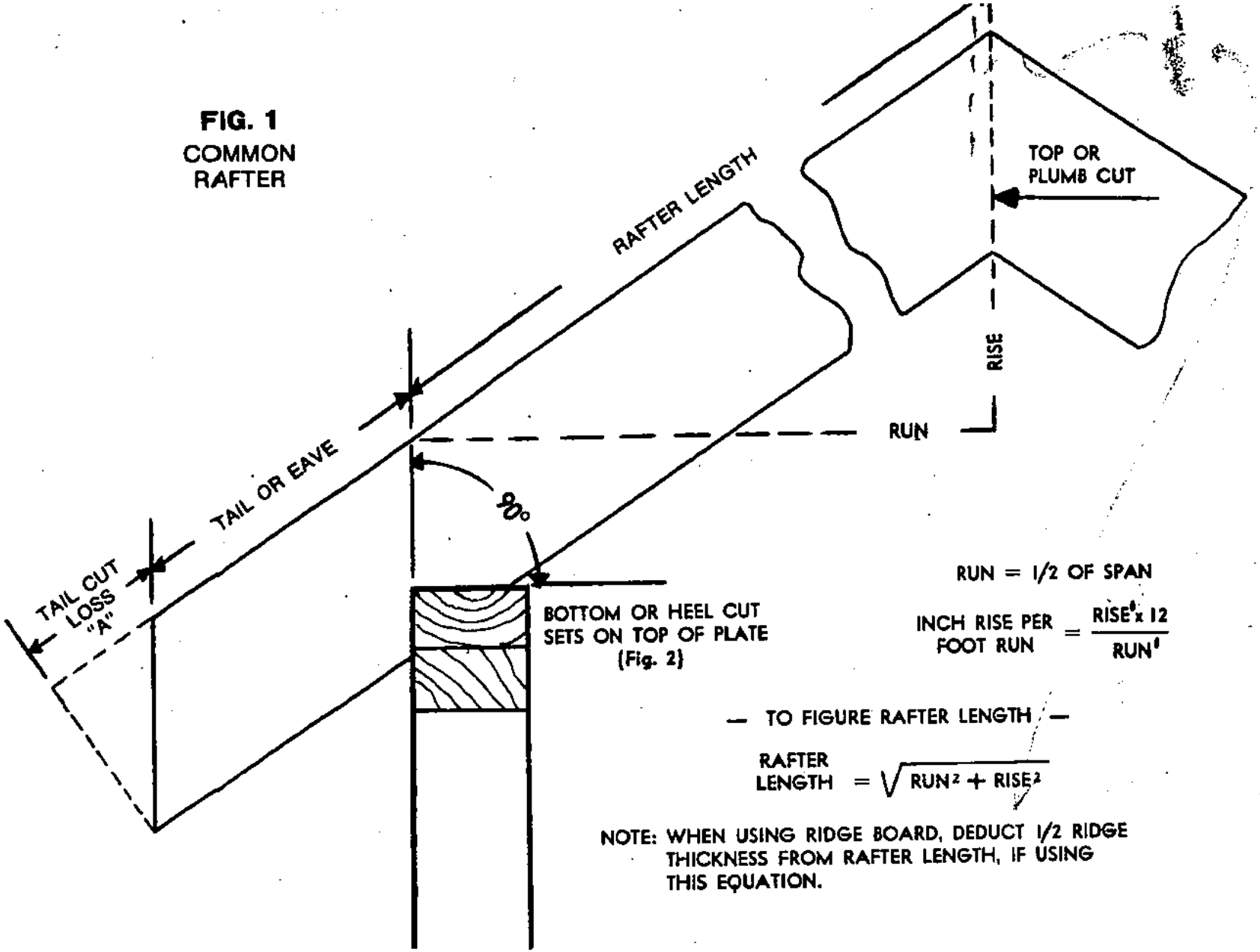
To find total overall length of a common rafter (see Fig. 1, p. 16) you may use this method. Example: For a 22" rise roof the length **per foot run** is 25.06". If building were 29' - 8" wide (forget the 8" **for now**) the run would be 14.5' (½ of 29'). 14.5 x 25.06" = 363.37", divided by 12" = 30.280 ft. (.280 of a foot multiplied by 12" = 3.36" or 3⅜") or 30' - 3⅜". Turn to "inches in building width" table (p. 38). Go down rise column to 22 and across to 8" (not 4)*. Add the 8⅜" to 30' - 3⅜" = 30' - 11¾". Deduct ½ the thickness of ridge and add on overhang. If a 12" wide eave is desired a minimum of 25.06" is needed, plus tail cut loss "A" (Fig. 1). If brick, consider distance brickwork extends out from edge of top plate. Figure hip-val rafters the same. Tail cut loss "A" is based on 8" lumber.

*Since TABLE on p. 38 is for bldg width NOT half of bldg width as normally used to speed

RAFTER
Length Per Foot of Run

Angle in Deg.	inch Rise	(Fig. 1) Tail Cut loss "A"	Common Rafters	Hip-Val Rafters
43¾	1	8" wide lumber	12.04"	17.00"
9½	2		12.16"	17.09"
14	3		12.37"	17.23"
18½	4	2¾"	12.65"	17.44"
22½	5		13.00"	17.69"
26½	6	4"	13.42"	18.00"
30¼	7		13.89"	18.36"
33¾	8		14.42"	18.76"
37	9	6"	15.00"	19.21"
39¾	10		15.62"	19.70"
42½	11		16.28"	20.22"
45	12	8"	16.97"	20.78"
47¼	13		17.69"	21.38"
49½	14		18.44"	22.00"
51¼	15	10"	19.21"	22.65"
53	16		20.00"	23.32"
54¾	17		20.81"	24.02"
56¼	18	12"	21.63"	24.74"
57¾	19		22.47"	25.47"
59	20		23.32"	26.23"
60¼	21	14"	24.19"	27.00"
61½	22		25.06"	27.78"
62½	23		25.94"	28.58"
63½	24	16"	26.83"	29.39"
64½	25		27.73"	30.22"
65¼	26		28.64"	31.05"
66	27	18"	29.55"	31.89"
66¾	28		30.46"	32.74"
67½	29		31.38"	33.60"
68¼	30	20"	32.31"	34.47"

FIG. 1
COMMON
RAFTER



RUN = 1/2 OF SPAN

$$\text{INCH RISE PER FOOT RUN} = \frac{\text{RISE}^{\prime} \times 12}{\text{RUN}^{\prime}}$$

— TO FIGURE RAFTER LENGTH —

$$\text{RAFTER LENGTH} = \sqrt{\text{RUN}^2 + \text{RISE}^2}$$

NOTE: WHEN USING RIDGE BOARD, DEDUCT 1/2 RIDGE THICKNESS FROM RAFTER LENGTH, IF USING THIS EQUATION.

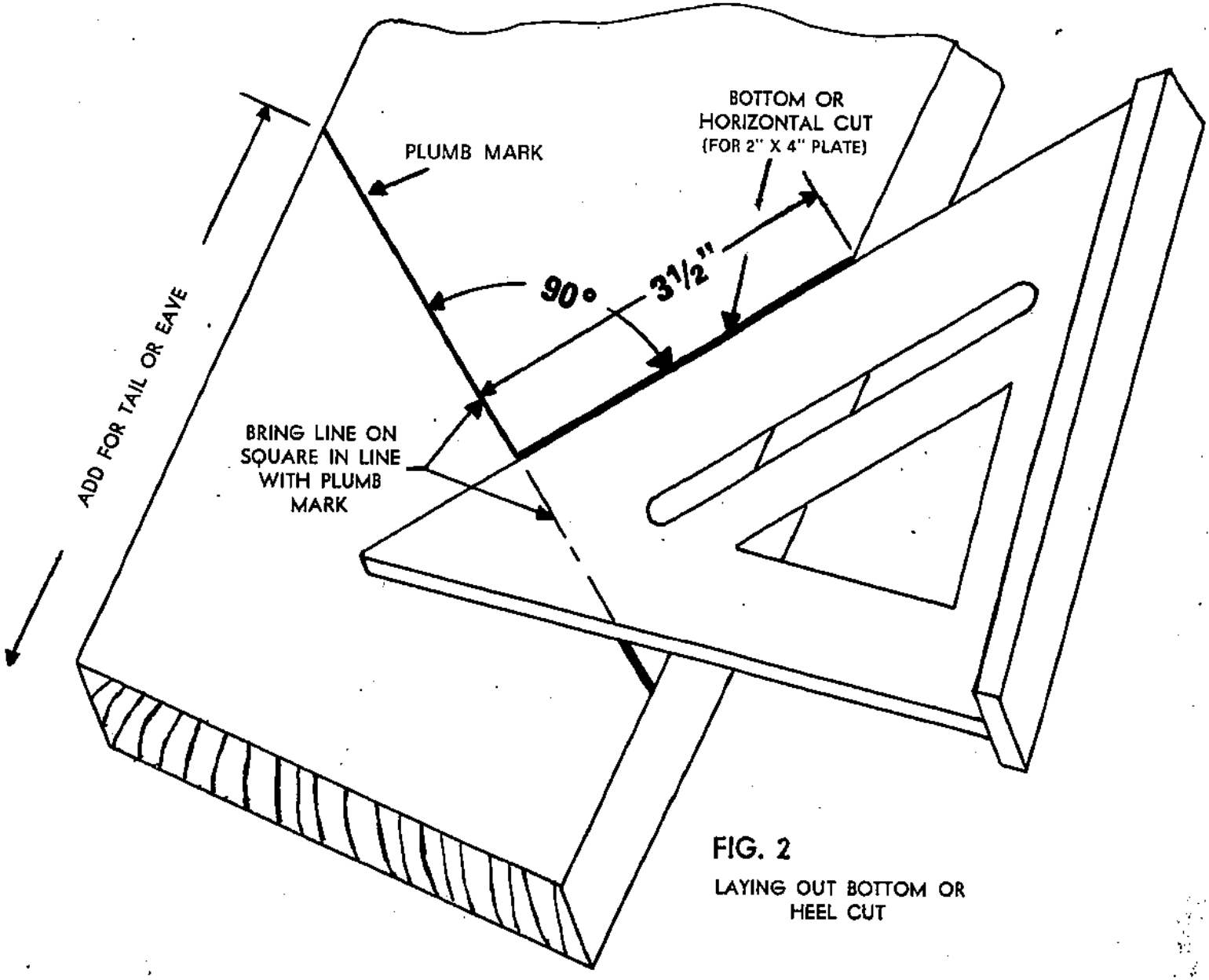


FIG. 2

LAYING OUT BOTTOM OR
HEEL CUT

FIG. 3

RELATIONSHIP BETWEEN RUN OF HIP OR VALLEY RAFTER TO THE RUN OF THE COMMON RAFTER

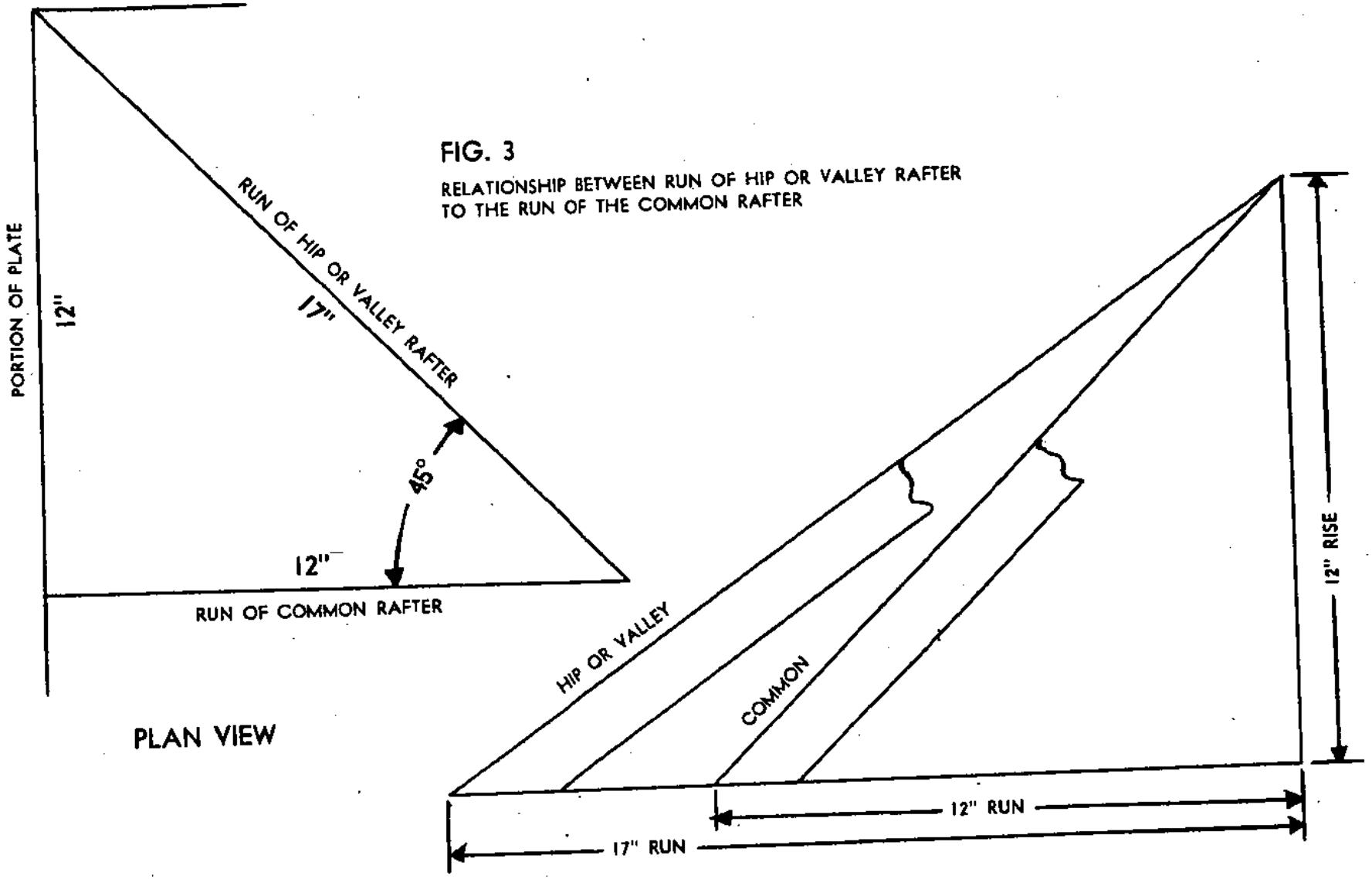
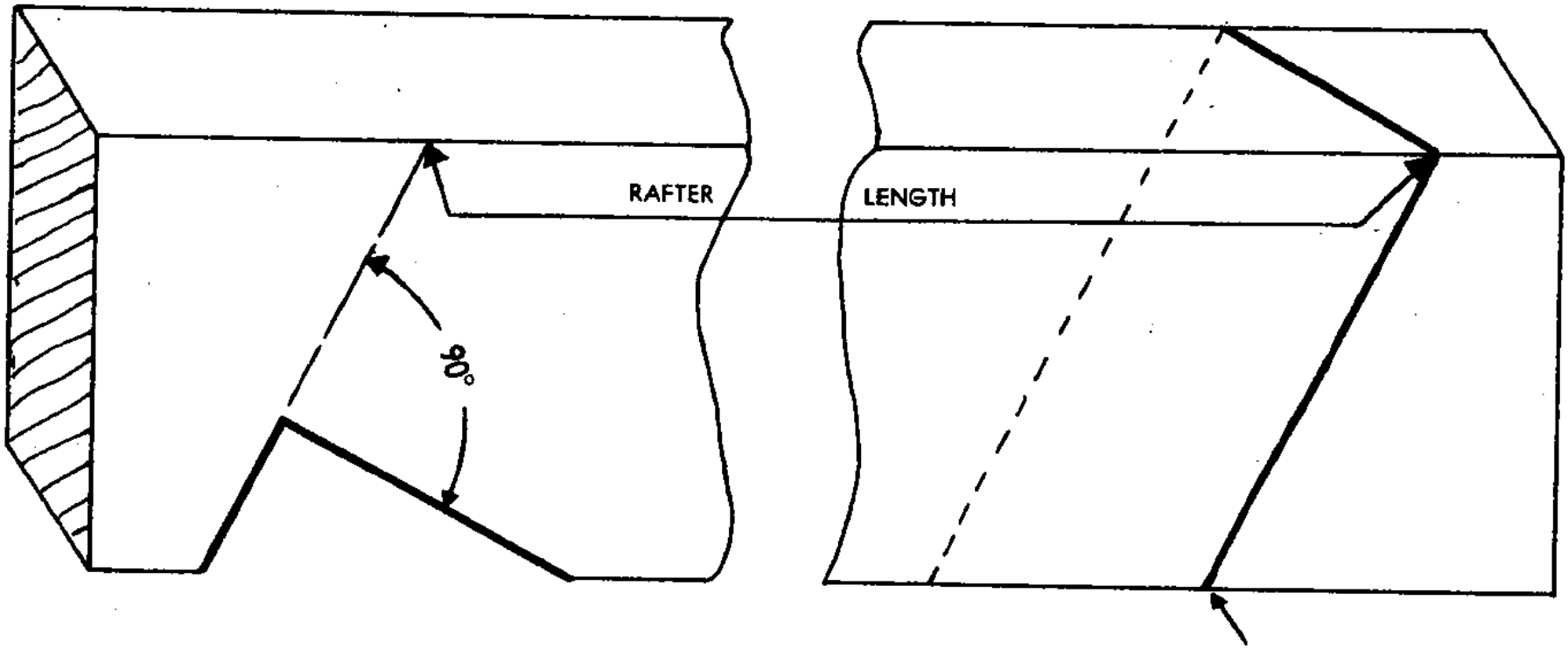


FIG. 4
LAYING OUT HIP OR VALLEY RAFTER



BOTTOM CUT: MARK PLUMB CUT, THEN BOTTOM CUT AT RIGHT ANGLE TO PLUMB CUT. USE HIP-VAL SCALE. (Fig. 2)

PLUMB CUT MARKED FROM *HIP-VAL SCALE*. USE *SAME NUMBER* AS USED ON COMMON-NUMBER REPRESENTING *INCH RISE* PER FOOT RUN — TILT SAW TO 45° AND CUT ALONG PLUMB MARK. THIS WILL GIVE BOTH PLUMB AND SIDE CUT WITH ONE SAWING OPERATION.

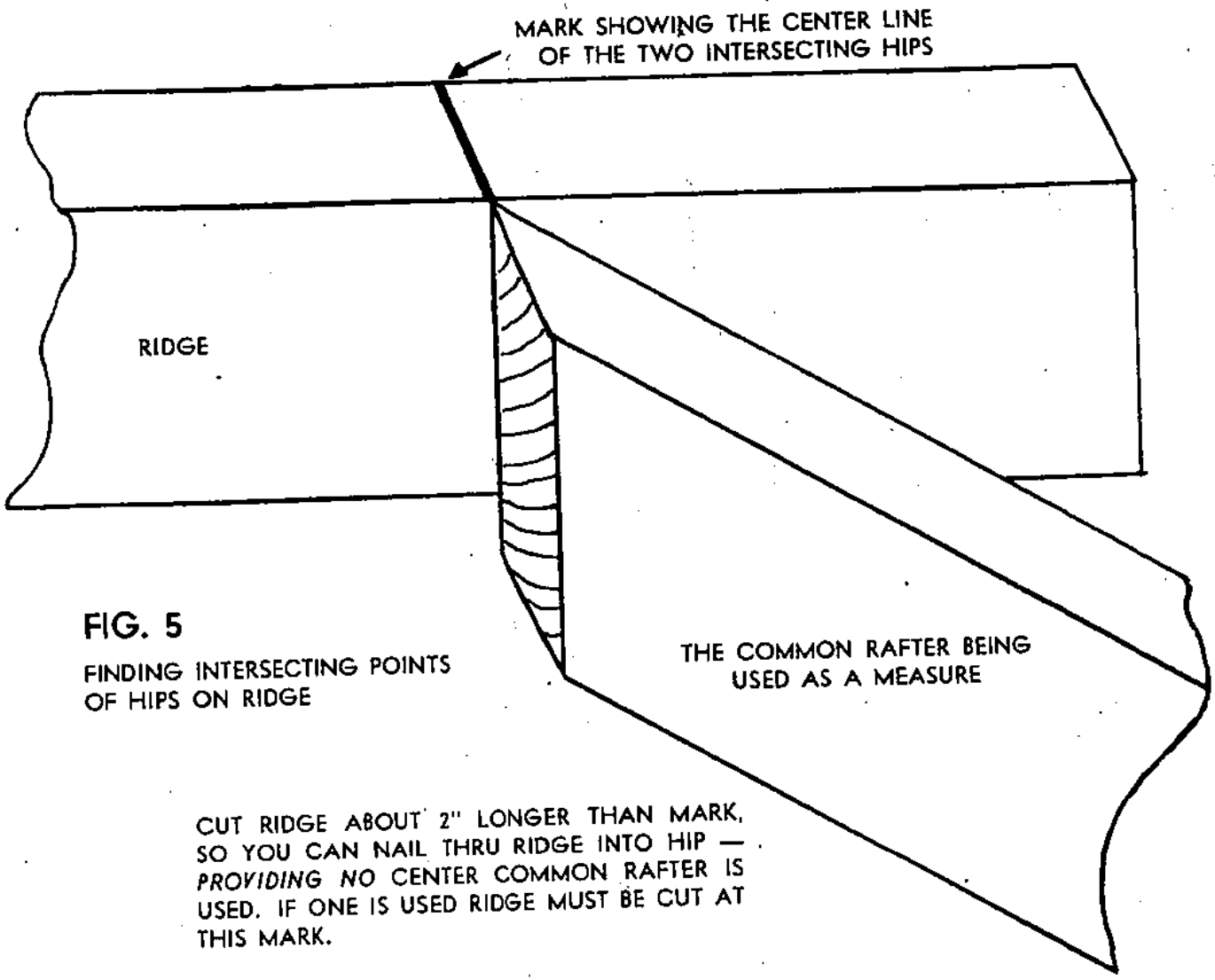


FIG. 5

FINDING INTERSECTING POINTS
OF HIPS ON RIDGE

CUT RIDGE ABOUT 2" LONGER THAN MARK, SO YOU CAN NAIL THRU RIDGE INTO HIP — *PROVIDING NO* CENTER COMMON RAFTER IS USED. IF ONE IS USED RIDGE MUST BE CUT AT THIS MARK.

FIG. 6

WHEN SETTING HIP, CUT OFF OUTSIDE CORNER OF PLATE, SHADED AREA. THIS ALLOWS HIP TO SET IN AGAINST A FULL FLAT CORNER, RATHER THAN AGAINST OUTSIDE POINT. THIS ALSO ALLOWS HIP TO COME INTO LINE WITH OTHER RAFTERS — LETTING ROOF BOARD LAY FLAT ON HIP.

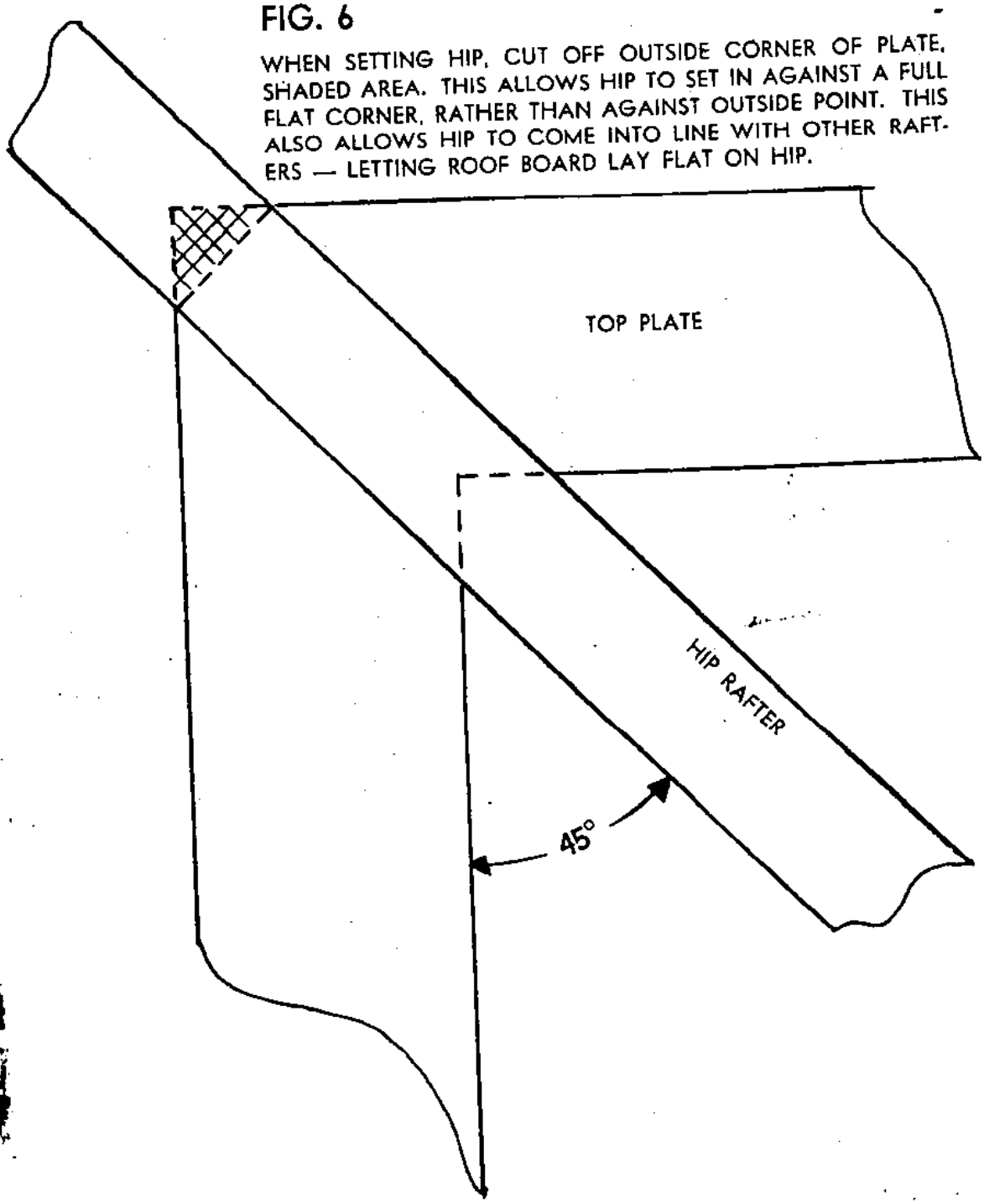
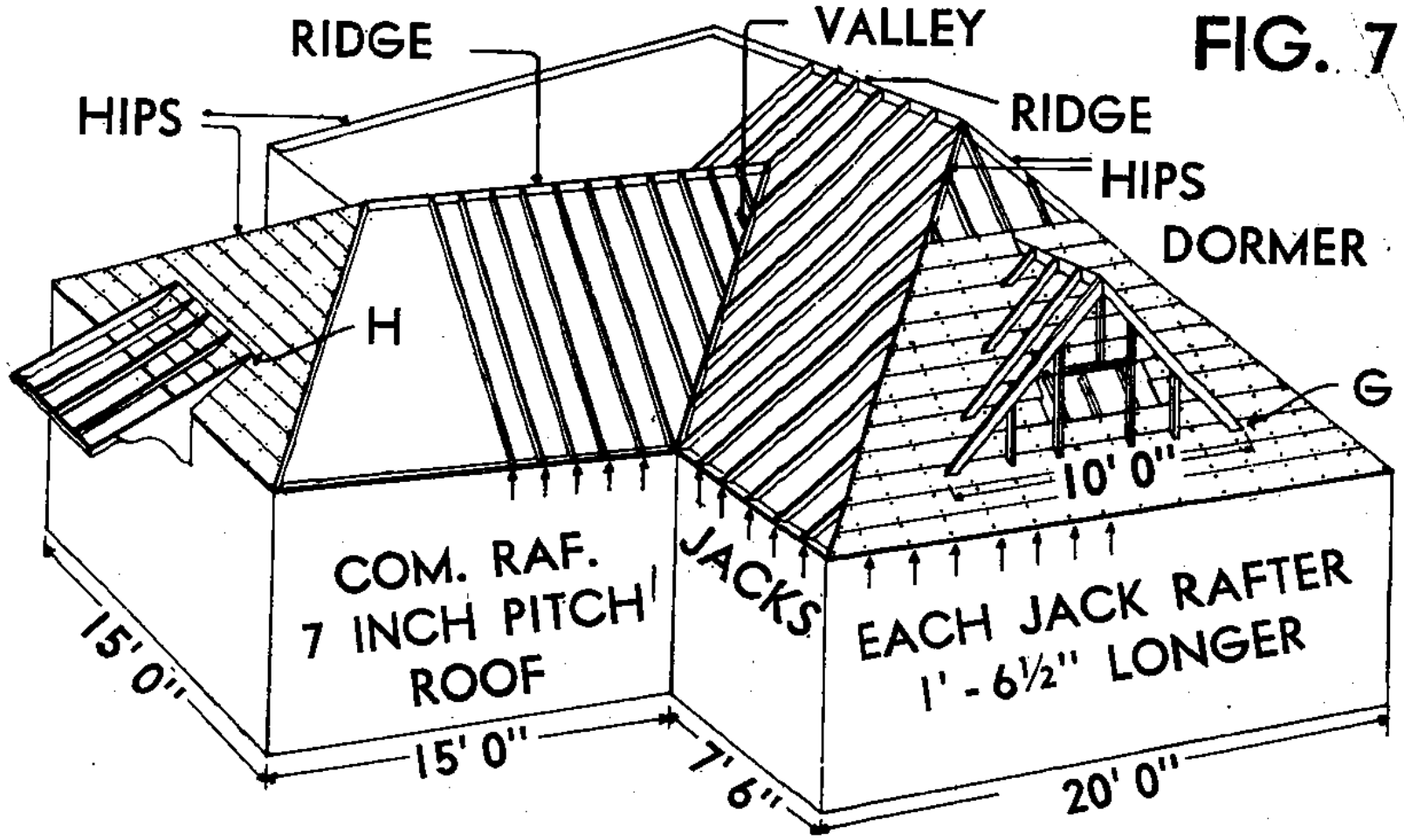


FIG. 7



ALL CUTS ON THIS ROOF MADE BY USING
THE NUMBER 7 (INCH RISE)

FIG. 8

SQUARE SHOWN IN 3 DIFFERENT POSITIONS WITH THE RESULTING ANGLES BEING FOUND BY PIVOTING SQUARE AT POINT B ON LINE X-Y

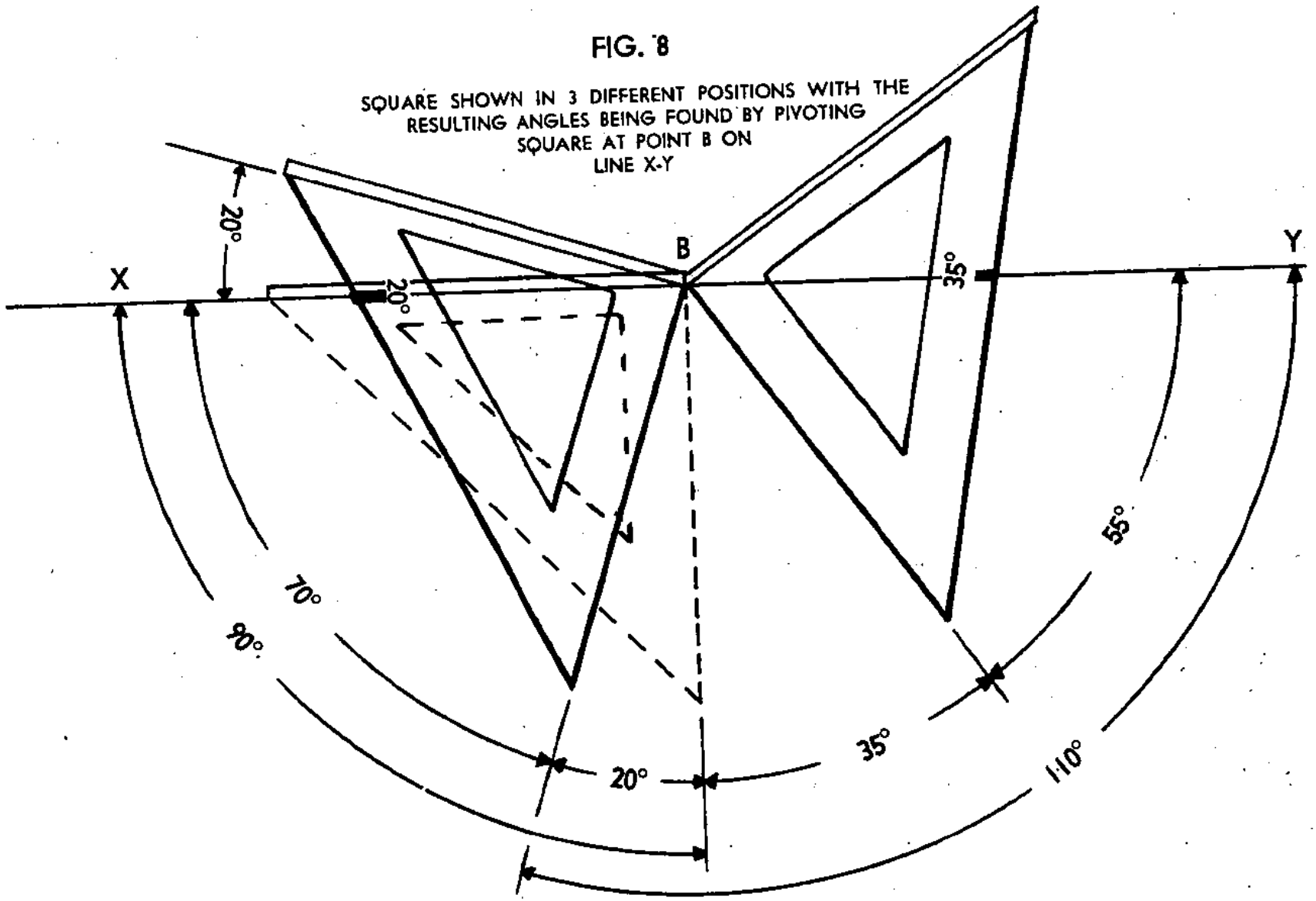
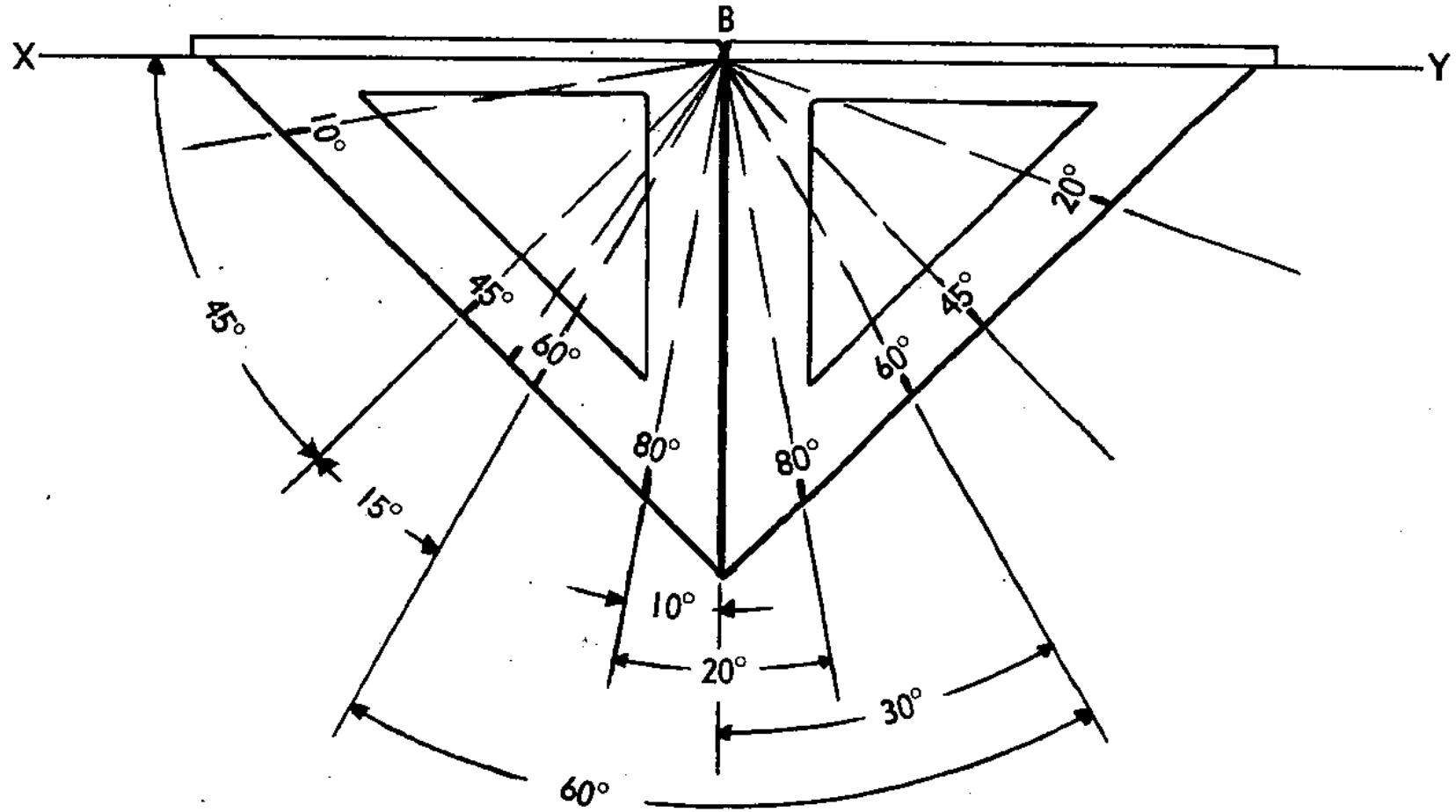


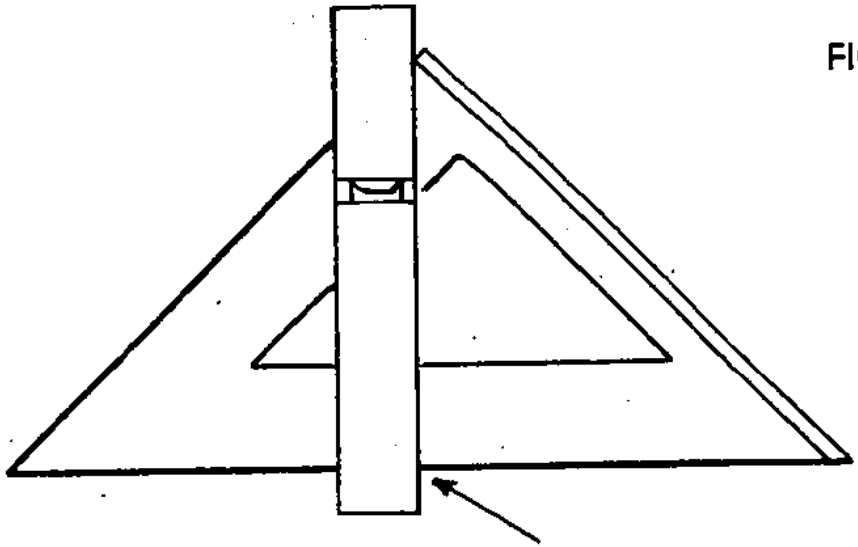
FIG. 9

SQUARE USED IN TWO POSITIONS GIVING FULL 180°

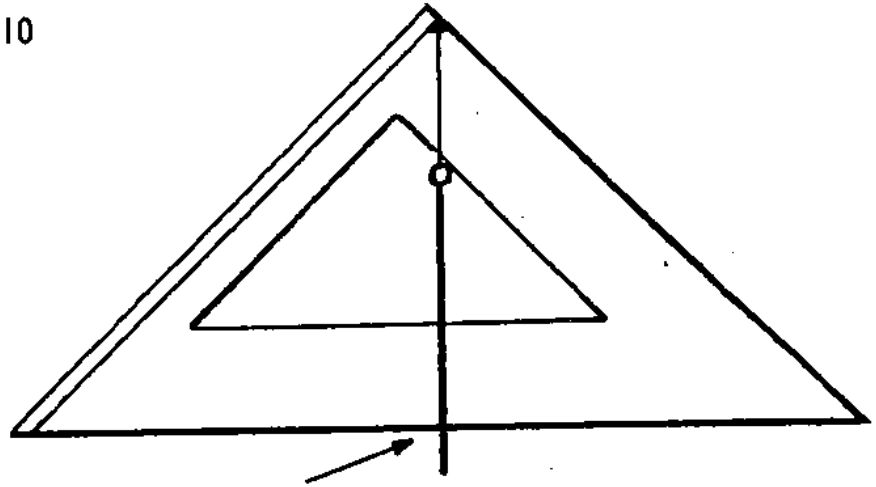


LINE X-Y REPRESENTS EDGE OF MATERIAL, POINT B IS PIVOT POINT OF SQUARE. HERE SQUARE IS NOT PIVOTED. POINTS ARE MARKED ON MATERIAL AT POINT B, AND AT DESIRED ANGLE. LINE DRAWN THRU THE TWO POINTS GIVES THE ANGLE WANTED.

FIG. 10

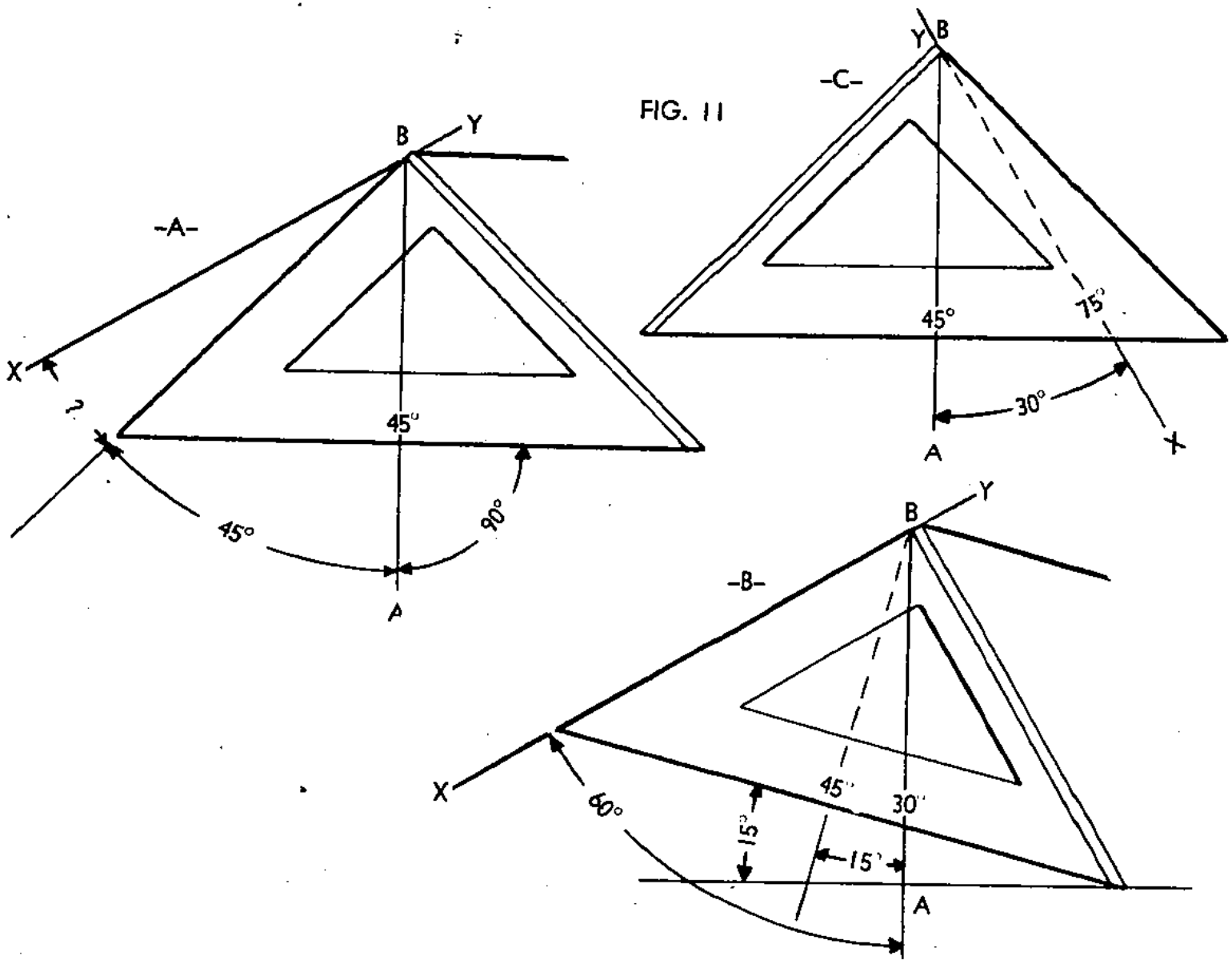


PLACE A 7" (OR LONGER) LEVEL ON FACE OF SQUARE WITH TOP EDGE OF LEVEL ALWAYS RESTING AGAINST "T" BAR AT PIVOT POINT ON SQUARE. *BUBBLE SHOULD ALWAYS INDICATE THAT THE LEVEL IS BEING HELD PLUMB.* PIVOT SQUARE FROM EDGE OF LEVEL. USING THE LEVEL AS A PLUMB LINE WILL GIVE FASTER READINGS BECAUSE YOU DON'T HAVE TO WAIT FOR THE SWINGING MOTION OF THE STRING (AS USED IN THE NEXT METHOD) TO STOP. ARROWS INDICATE POINT AT WHICH DEGREE IS SHOWN.

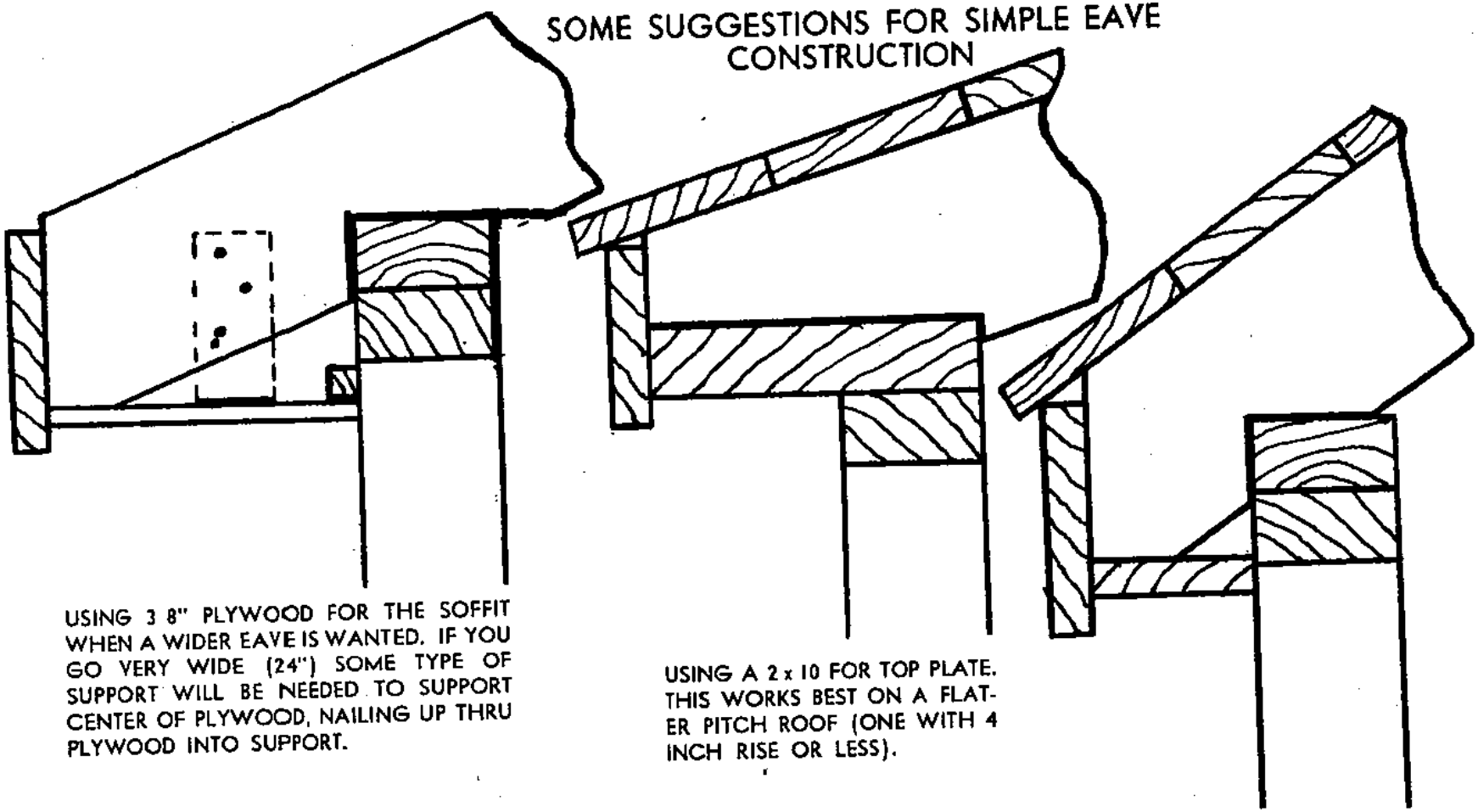


SQUARE HAS A NOTCH AT PIVOT POINT THROUGH WHICH A SMALL STRING CAN BE PLACED. ATTACH A STRAIGHT PIECE OF WIRE TO THE STRING WHICH WILL ACT AS A WEIGHTED POINTER, ALWAYS HANGING STRAIGHT DOWN (PLUMB). YOU MAY WISH TO EXTEND THE STRING PAST THE DEGREE SCALE AND PLACE SOME TYPE OF SMALL WEIGHT ON THE END TO MAKE IT HANG PLUMB.

FIG. 11



SOME SUGGESTIONS FOR SIMPLE EAVE CONSTRUCTION



USING 3 8" PLYWOOD FOR THE SOFFIT WHEN A WIDER EAVE IS WANTED. IF YOU GO VERY WIDE (24") SOME TYPE OF SUPPORT WILL BE NEEDED TO SUPPORT CENTER OF PLYWOOD, NAILING UP THRU PLYWOOD INTO SUPPORT.

USING A 2 x 10 FOR TOP PLATE. THIS WORKS BEST ON A FLATER PITCH ROOF (ONE WITH 4 INCH RISE OR LESS).

WHERE VERY LITTLE OVERHANG IS USED.

WIDTH OF BUILDING

Inch Rise	3 FEET Com.	3 FEET Hip	4 FEET Com.	4 FEET Hip
1	1'- 6 1/16"	2'- 1½"	2'- ⅛"	2'-10 "
2	1'- 6¼"	2'- 1⅝"	2'- ⅜"	2'-10¼"
3	1'- 6½"	2'- 1⅞"	2'- ¾"	2'-10½"
4	1'- 7 "	2'- 2¼"	2'- 1⅜"	2'-10⅞"
5	1'- 7½"	2'- 2⅝"	2'- 2 "	2'-11⅜"
6	1'- 8⅛"	2'- 3 "	2'- 2¾"	3'- 0 "
7	1'- 8⅞"	2'- 3½"	2'- 3¾"	3'- ¾"
8	1'- 9⅝"	2'- 4⅛"	2'- 4⅞"	3'- 1½"
9	1'-10½"	2'- 4⅞"	2'- 6 "	3'- 2⅜"
10	1'-11⅜"	2'- 5⅝"	2'- 7¼"	3'- 3⅜"
11	2'- ⅜"	2'- 6⅜"	2'- 8⅝"	3'- 4⅜"
12	2'- 1½"	2'- 7⅛"	2'-10 "	3'- 5⅝"

Inch Rise	5 FEET Com.	5 FEET Hip	6 FEET Com.	6 FEET Hip
1	2'- 6⅛"	3'- 6½"	3'- ⅛"	4'- 3 "
2	2'- 6½"	3'- 6⅞"	3'- ½"	4'- 3¼"
3	2'- 7 "	3'- 7⅛"	3'- 1⅛"	4'- 3⅝"
4	2'- 7¾"	3'- 7⅝"	3'- 2 "	4'- 4⅜"
5	2'- 8½"	3'- 8¼"	3'- 3 "	4'- 5⅛"
6	2'- 9½"	3'- 9 "	3'- 4¼"	4'- 6 "
7	2'-10¾"	3'- 9⅞"	3'- 5¾"	4'- 7⅛"
8	3'- ⅛"	3'-10⅞"	3'- 7¼"	4'- 8¼"
9	3'- 1½"	4'- 0 "	3'- 9 "	4'- 9⅝"
10	3'- 3⅛"	4'- 1¼"	3'-10⅞"	4'-11⅛"
11	3'- 4¾"	4'- 2½"	4'- ⅞"	5'- ⅝"
12	3'- 6½"	4'- 4 "	4'- 2⅞"	5'- 2⅜"

WIDTH OF BUILDING

NOT RUN

Inch Rise	7 FEET Com.	7 FEET Hip	8 FEET Com.	8 FEET Hip
1	3'- 6⅛"	4'-11½"	4'- ⅛"	5'- 8 "
2	3'- 6⅝"	4'-11⅞"	4'- ⅜"	5'- 8⅜"
3	3'- 7¼"	5'- ¼"	4'- 1½"	5'- 8⅞"
4	3'- 8⅜"	5'- 1⅛"	4'- 2⅝"	5'- 9¾"
5	3'- 9½"	5'- 2 "	4'- 4 "	5'-10¾"
6	3'-11 "	5'- 3 "	4'- 5⅝"	6'- 0 "
7	4'- ¾"	5'- 4¼"	4'- 7⅝"	6'- 1½"
8	4'- 2½"	5'- 5⅝"	4'- 9⅝"	6'- 3 "
9	4'- 4½"	5'- 7¼"	5'- 0 "	6'- 4⅞"
10	4'- 6¾"	5'- 9 "	5'- 2½"	6'- 6¾"
11	4'- 9 "	5'-10¾"	5'- 5⅛"	6'- 8¾"
12	4'-11⅜"	6'- ¾"	5'- 7⅞"	6'-11⅛"

Inch Rise	9 FEET Com.	9 FEET Hip	10 FEET Com.	10 FEET Hip
1	4'- 6¼"	6'- 4½"	5'- ¼"	7'- 1 "
2	4'- 6¾"	6'- 5 "	5'- ⅞"	7'- 1½"
3	4'- 7⅝"	6'- 5½"	5'- 1⅞"	7'- 2⅛"
4	4'- 9 "	6'- 6⅜"	5'- 3¼"	7'- 3¼"
5	4'-10½"	6'- 7⅝"	5'- 5 "	7'- 4½"
6	5'- ⅝"	6'- 9 "	5'- 7⅛"	7'- 6 "
7	5'- 2⅝"	6'-10⅝"	5'- 9½"	7'- 7¾"
8	5'- 4⅞"	7'- ⅜"	6'- ⅛"	7'- 9¾"
9	5'- 7½"	7'- 2½"	6'- 3 "	8'- 0 "
10	5'-10⅜"	7'- 4⅝"	6'- 6⅛"	8'- 2½"
11	6'- 1¼"	7'- 7 "	6'- 9⅜"	8'- 5⅛"
12	6'- 4⅜"	7'- 9½"	7'- ⅞"	8'- 7⅞"

WIDTH OF BUILDING

NOT RUN

Inch Rise	11 FEET Com.	11 FEET Hip	12 FEET Com.	12 FEET Hip
1	5'- 6¼"	7'- 9½"	6'- ¼"	8'- 6 "
2	5'- 7 "	7'-10 "	6'- 1 "	8'- 6½"
3	5'- 8 "	7'-10¾"	6'- 2¼"	8'- 7⅜"
4	5'- 9⅝"	8'- 0 "	6'- 3⅞"	8'- 8⅝"
5	5'-11½"	8'- 1⅜"	6'- 6 "	8'-10¼"
6	6'- 1⅞"	8'- 3 "	6'- 8½"	9'- 0 "
7	6'- 4⅛"	8'- 4⅞"	6'-11⅜"	9'- 2⅛"
8	6'- 7⅜"	8'- 7⅛"	7'- 2½"	9'- 4⅝"
9	6'-10½"	8'- 9⅝"	7'- 6 "	9'- 7¼"
10	7'- 2 "	9'- ⅜"	7'- 9¾"	9'-10¼"
11	7'- 5½"	9'- 3¼"	8'- 1⅝"	10'- 1⅜"
12	7'- 9⅜"	9'- 6¼"	8'- 5⅞"	10'- 4⅝"

Inch Rise	13 FEET Com.	13 FEET Hip	14 FEET Com.	14 FEET Hip
1	6'- 6¼"	9'- 2½"	7'- ¼"	9'-11 "
2	6'- 7⅛"	9'- 3 "	7'- 1⅛"	9'-11⅝"
3	6'- 8½"	9'- 4 "	7'- 2⅝"	10'- ⅝"
4	6'-10¼"	9'- 5⅜"	7'- 4½"	10'- 2⅛"
5	7'- ½"	9'- 7⅛"	7'- 7 "	10'- 3⅞"
6	7'- 3¼"	9'- 9 "	7'-10 "	10'- 6 "
7	7'- 6⅜"	9'-11¼"	8'- 1⅜"	10'- 8½"
8	7'- 9¾"	10'- 2 "	8'- 5 "	10'-11⅜"
9	8'- 1½"	10'- 4⅞"	8'- 9 "	11'- 2½"
10	8'- 5⅝"	10'- 8⅛"	9'- 1⅜"	11'- 5⅞"
11	8'- 9¾"	10'-11⅝"	9'- 6 "	11'- 9⅝"
12	9'- 2⅜"	11'- 3 "	9'-10¾"	12'- 1½"

WIDTH OF BUILDING

NOT RUN

Inch Rise	15 FEET Com.	15 FEET Hip	16 FEET Com.	16 FEET Hip
1	7'- 6¼"	10'- 7½"	8'- ⅜"	11'- 4 "
2	7'- 7¼"	10'- 8⅛"	8'- 1⅜"	11'- 4¾"
3	7'- 8¾"	10'- 9¼"	8'- 3 "	11'- 5⅞"
4	7'-10⅞"	10'-10⅞"	8'- 5¼"	11'- 7½"
5	8'- 1½"	11'- ¾"	8'- 8 "	11'- 9⅝"
6	8'- 4¾"	11'- 3 "	8'-11½"	12'- 0 "
7	8'- 8⅜"	11'- 5⅝"	9'- 3¼"	12'- 2⅞"
8	9'- ¼"	11'- 8¾"	9'- 7⅜"	12'- 6⅛"
9	9'- 4½"	12'- ⅛"	10'- 0 "	12'- 9⅝"
10	9'- 9¼"	12'- 3¾"	10'- 5 "	13'- 1⅝"
11	10'- 2⅛"	12'- 7¾"	10'-10¼"	13'- 5⅞"
12	10'- 7¼"	12'-11⅞"	11'- 3¾"	13'-10¼"

Inch Rise	17 FEET Com.	17 FEET Hip	18 FEET Com.	18 FEET Hip
1	8'- 6⅜"	12'- ½"	9'- ⅜"	12'- 9 "
2	8'- 7½"	12'- 1¼"	9'- 1½"	12'- 9⅞"
3	8'- 9⅛"	12'- 2½"	9'- 3⅜"	12'-11⅛"
4	8'-11⅝"	12'- 4¼"	9'- 5⅞"	13'- 1 "
5	9'- 2½"	12'- 6½"	9'- 9 "	13'- 3⅜"
6	9'- 6¼"	12'- 9 "	10'- ⅞"	13'- 6 "
7	9'-10¼"	13'- 0 "	10'- 5⅛"	13'- 9¼"
8	10'- 2⅝"	13'- 3½"	10'- 9¾"	14'- ⅞"
9	10'- 7½"	13'- 7¼"	11'- 3 "	14'- 4⅞"
10	11'- ⅞"	13'-11½"	11'- 8⅝"	14'- 9⅜"
11	11'- 6½"	14'- 4 "	12'- 2½"	15'- 2 "
12	12'- ¼"	14'- 8⅝"	12'- 8¾"	15'- 7 "

WIDTH OF BUILDING

NOT RUN

Inch	19 FEET		20 FEET	
Rise	Com.	Hip	Com.	Hip
1	9'- 6⅜"	13'- 5½"	10'- ⅜"	14'- 2 "
2	9'- 7⅝"	13'- 6⅜"	10'- 1⅝"	14'- 2⅞"
3	9'- 9⅝"	13'- 7¾"	10'- 3¾"	14'- 4⅜"
4	10'- ¼"	13'- 9¾"	10'- 6½"	14'- 6⅜"
5	10'- 3½"	14'- ⅛"	10'-10 "	14'- 9 "
6	10'- 7⅝"	14'- 3 "	11'- 2¼"	15'- 0 "
7	11'- ⅛"	14'- 6⅜"	11'- 7 "	15'- 3⅝"
8	11'- 5 "	14'-10¼"	12'- ¼"	15'- 7⅝"
9	11'-10½"	15'- 2½"	12'- 6 "	16'- ⅛"
10	12'- 4½"	15'- 7¼"	13'- ¼"	16'- 5 "
11	12'-10⅝"	16'- ⅛"	13'- 6⅞"	16'-10¼"
12	13'- 5¼"	16'- 5⅜"	14'- 1¾"	17'- 3⅞"
13	14'- ¼"	16'-11 "	14'- 9 "	17'- 9¾"
14	14'- 7¼"	17'- 5 "	15'- 4⅜"	18'- 4 "
15	15'- 2½"	17'-11⅛"	16'- ⅛"	18'-10½"
16	15'-10 "	18'- 5½"	16'- 8 "	19'- 5¼"
17	16'- 5⅝"	19'- ¼"	17'- 4⅛"	20'- ¼"
18	17'- 1½"	19'- 7 "	18'- ¼"	20'- 7⅜"
19	17'- 9½"	20'- 2 "	18'- 8¾"	21'- 2¾"
20	18'- 5½"	20'- 9¼"	19'- 5¼"	21'-10⅜"
21	19'- 1¾"	21'- 4⅛"	20'- 1⅞"	22'- 6 "
22	19'-10⅛"	22'- 0 "	20'-10⅝"	23'- 1⅞"
23	20'- 6½"	22'- 7⅛"	21'- 7⅜"	23'- 9⅞"
24	21'- 2⅞"	23'- 3¼"	22'- 4¼"	24'- 6 "

WIDTH OF BUILDING

NOT RUN

Inch Rise	21 FEET Com.	Hip	22 FEET Com.	Hip
1	10'- 6⅜"	14'-10½"	11'- ½"	15'- 7 "
2	10'- 7¾"	14'-11⅜"	11'- 1¾"	15'- 8 "
3	10'-10 "	15'- 1 "	11'- 4⅛"	15'- 9½"
4	11'- ⅞"	15'- 3⅛"	11'- 7⅛"	15'-11⅞"
5	11'- 4⅛"	15'- 5⅞"	11'-11 "	16'- 2¾"
6	11'- 9 "	15'- 9 "	12'- 3⅝"	16'- 6 "
7	12'- 2 "	16'- ¾"	12'- 8⅞"	16'-10 "
8	12'- 7½"	16'- 5 "	13'- 2⅝"	17'- 2⅜"
9	13'- 1½"	16'- 9¾"	13'- 9 "	17'- 7⅜"
10	13'- 8 "	17'- 2⅞"	14'- 3⅞"	18'- ¾"
11	14'- 3 "	17'- 8⅜"	14'-11⅛"	18'- 6½"

Inch Rise	23 FEET Com.	Hip	24 FEET Com.	Hip
1	11'- 6½"	16'- 3½"	12'- ½"	17'- 0 "
2	11'- 7⅞"	16'- 4½"	12'- 1⅞"	17'- 1⅛"
3	11'-10⅜"	16'- 6⅛"	12'- 4½"	17'- 2¾"
4	12'- 1½"	16'- 8⅝"	12'- 7¾"	17'- 5¼"
5	12'- 5½"	16'-11⅝"	13'- 0 "	17'- 8⅜"
6	12'-10⅜"	17'- 3 "	13'- 5 "	18'- 0 "
7	13'- 3⅞"	17'- 7⅛"	13'-10¾"	18'- 4⅜"
8	13'- 9⅞"	17'-11¾"	14'- 5 "	18'- 9⅛"
9	14'- 4½"	18'- 5 "	15'- 0 "	19'- 2½"
10	14'-11¾"	18'-10⅝"	15'- 7½"	19'- 8⅜"
11	15'- 7¼"	19'- 4⅝"	16'- 3⅜"	20'- 2⅝"
12	16'- 3⅛"	19'-11 "	16'-11⅝"	20'- 9⅜"

WIDTH OF BUILDING

NOT RUN

Inch Rise	25 FEET Com.	25 FEET Hip	26 FEET Com.	26 FEET Hip
1	12'- 6½"	17'- 8½"	13'- ½"	18'- 5 "
2	12'- 8 "	17'- 9⅝"	13'- 2⅛"	18'- 6¼"
3	12'-10⅝"	17'-11⅜"	13'- 4⅞"	18'- 8 "
4	13'- 2⅛"	18'- 2 "	13'- 8½"	18'-10¾"
5	13'- 6½"	18'- 5¼"	14'- 1 "	19'- 2⅛"
6	13'-11¾"	18'- 9 "	14'- 6½"	19'- 6 "
7	14'- 5¾"	19'- 1½"	15'- ¾"	19'-10⅝"
8	15'- ¼"	19'- 6½"	15'- 7½"	20'- 3⅞"
9	15'- 7½"	20'- ⅛"	16'- 3 "	20'- 9¾"

Inch Rise	27 FEET Com.	27 FEET Hip	28 FEET Com.	28 FEET Hip
1	13'- 6½"	19'- 1½"	14'- ⅝"	19'-10 "
2	13'- 8¼"	19'- 2¾"	14'- 2¼"	19'-11¼"
3	13'-11 "	19'- 4⅝"	14'- 5¼"	20'- 1¼"
4	14'- 2⅞"	19'- 7½"	14'- 9⅛"	20'- 4⅛"
5	14'- 7½"	19'-11 "	15'- 2 "	20'- 7⅞"
6	15'- 1 "	20'- 3 "	15'- 7⅞"	21'- 0 "
7	15'- 7¾"	20'- 7¾"	16'- 2⅝"	21'- 5 "
8	16'- 2¾"	21'- 1¼"	16'- 9⅞"	21'-10⅝"
9	16'-10½"	21'- 7⅜"	17'- 6 "	22'- 5 "
10	17'- 7 "	22'- 2 "	18'- 2⅝"	22'-11⅞"
11	18'- 3¾"	22'- 9 "	18'-11⅞"	23'- 7⅛"
12	19'- 1⅛"	23'- 4½"	19'- 9⅝"	24'- 3 "

WIDTH OF BUILDING

Inch	29 FEET		30 FEET	
Rise	Com.	Hip	Com.	Hip
1	14'- 6⅝"	20'- 6½"	15'- 5⅛"	21'- 3 "
2	14'- 8⅜"	20'- 7¾"	15'- 2⅜"	21'- 4"⅜
3	14'-11½"	20'- 9⅞"	15'- 5½"	21'- 6½"
4	15'- 3½"	21'- ⅞"	15'- 9¾"	21'- 9⅝"
5	15'- 8½"	21'- 4¾"	16'- 3 "	22'- 1⅛"
6	16'- 2⅝"	21'- 9 "	16'- 9¼"	22'- 6 "
7	16'- 9⅝"	22'- 2⅛"	17'- 4½"	22'-11⅜"
8	17'- 5⅛"	22'- 8 "	18'- ⅜"	23'- 5⅜"
9	18'- 1½"	23'- 2⅝"	18'- 9 "	24'- ⅛"
10	18'-10⅜"	23'- 9¾"	19'- 6⅜"	24'- 7½"
11	19'- 8 "	24'- 5¼"	20'- 4¼"	25'- 3⅜"

Inch	31 FEET		32 FEET	
Rise	Com.	Hip	Com.	Hip
1	15'- 6⅝"	21'-11½"	16'- 5⅛"	22'- 8 "
2	15'- 8½"	22'- ⅞"	16'- 2½"	22'- 9½"
3	15'-11⅝"	22'- 3⅛"	16'- 5⅞"	22'-11⅝"
4	16'- 4⅛"	22'- 6⅜"	16'-10⅜"	23'- 3 "
5	16'- 9½"	22'-10⅜"	17'- 4 "	23'- 7¼"
6	17'- 4 "	23'- 3 "	17'-10⅝"	24'- 0 "
7	17'-11⅛"	23'- 8½"	18'- 6⅜"	24'- 5¾"
8	18'- 7⅝"	24'- 2¾"	19'- 2¾"	25'- ⅛"
9	19 - 4½"	24'- 9¾	20'- 0 "	25'- 7⅜"
10	20'- 2¼"	25'- 5⅜"	20'-10 "	26'- 3¼"
11	21'- ⅜"	26'- 1½"	21'- 8½"	26'-11⅝"
12	21'-11 "	26'-10⅛"	22'- 7½"	27'- 8½"

WIDTH OF BUILDING

Inch Rise	33 FEET Com.	33 FEET Hip	34 FEET Com.	34 FEET Hip
1	16'- 6⅝"	23'- 4½"	17'- ¾"	24'- 1 "
2	16'- 8⅜"	23'- 6 "	17'- 2¾"	24'- 2½"
3	17'- 0 "	23'- 8¼"	17'- 6¼"	24'- 4⅞"
4	17'- 4¾"	23'-11¾"	17'-11 "	24'- 8½"
5	17'-10½"	24'- 4⅛"	18'- 5 "	25'- ⅞"
6	18'- 5⅜"	24'- 9 "	19'- ⅛"	25'- 6 "
7	19'- 1⅜"	25'- 2⅞"	19'- 8⅜"	26'- ⅛"
8	19'-10 "	25'- 9½"	20'- 5⅛"	26'- 6⅞"
9	20'- 7½"	26'- 5 "	21'- 3 "	27'- 2⅝"
10	21'- 5⅞"	27'- ⅛"	22'- 1½"	27'-10⅞"
11	22'- 4⅝"	27'- 9¾"	23'- ⅞"	28'- 7¾"
12	23'- 4 "	28'- 6⅞"	24'- ½"	29'- 5¼"
13	24'- 4⅛"	29'- 4⅝"	25'- ⅞"	30'- 3¼"
14	25'- 4¼"	30'- 3 "	26'- 1½"	31'- 2 "

Inch Rise	35 FEET Com.	35 FEET Hip	36 FEET Com.	36 FEET Hip
1	17'- 6¾"	24'- 9½"	18'- ¾"	25'- 6 "
2	17'- 8⅞"	24'-11 "	18'- 2⅞"	25'- 7⅝"
3	18'- ½"	25'- 1½"	18'- 6⅝"	25'-10⅛"
4	18'- 5⅜"	25'- 5¼"	18'-11⅞"	26'- 1⅞"
5	18'-11½"	25'- 9¾"	19'- 6 "	26'- 6⅝"
6	19'- 6⅞"	26'- 3 "	20'- 1½"	27'- 0 "
7	20'- 3⅜"	26'-10¼"	20'-10¼"	27'- 6½"
8	21'- ⅜"	27'- 4¼"	21'- 7½"	28'- 1⅝"
9	21'-10½"	28'- ¼"	22'- 6 "	28'- 9¾"
10	22'- 9⅜"	28'- 8¾"	23'- 5⅛"	29'- 6⅝"
11	23'- 8⅞"	29'- 5⅞"	24'- 5 "	30'- 4 "
12	24'- 9 "	30'- 3⅝"	25'- 5½"	31'- 2 "
13	25'- 9¾"	31'- 1⅞"	26'- 6⅝"	32'- ⅝"
14	26'-10¾"	32'- 1 "	27'- 7⅞"	33'- 0 "

WIDTH OF BUILDING

Inch Rise	37 FEET Com.	37 FEET Hip	38 FEET Com.	38 FEET Hip
1	18'- 6¾"	26'- 2½"	19'- ¾"	26'-11 "
2	18'- 9 "	26'- 4⅛"	19'- 3 "	27'- ¾"
3	19'- ¾"	26'- 6¾"	19'- 7 "	27'- 3⅜"
4	19'- 6⅛"	26'-10⅝"	20'- ⅜"	27'- 7⅜"
5	20'- ½"	27'- 3½"	20'- 7 "	28'- ⅜"
6	20'- 8¼"	27'- 9 "	21'- 3 "	28'- 6 "
7	21'- 5¼"	28'- 3⅝"	22'- ⅛"	29'- ⅞"
8	22'- 2¾"	28'-11 "	22'-10 "	29'- 8½"
9	23'- 1½"	29'- 7⅜"	23'- 9 "	30'- 5 "
10	24'- 1 "	30'- 4½"	24'- 8¾"	31'- 2⅜"
11	25'- 1⅛"	31'- 2⅛"	25'- 9⅜"	32'- ⅛"
12	26'- 2 "	32'- ⅜"	26'-10½"	32'-10⅞"
13	27'- 3½"	32'-11¼"	28'- ⅜"	33'-10 "
14	28'- 5⅛"	33'-11 "	29'- 2⅜"	34'-10 "

Inch Rise	39 FEET Com.	39 FEET Hip	40 FEET Com.	40 FEET Hip
1	19'- 6¾"	27'- 7½"	20'- ¾"	28'- 4 "
2	19'- 9⅛"	27'- 9¼"	20'- 3¾"	28'- 5¾"
3	20'- 1⅛"	28'- 0 "	20'- 7⅜"	28'- 8⅝"
4	20'- 6¾"	28'- 4⅛"	21'- 1 "	29'- ¾"
5	21'- 1½"	28'- 9¼"	21'- 8 "	29'- 6 "
6	21'- 9¾"	29'- 3 "	22'- 4⅜"	30'- 0 "
7	22'- 7⅛"	29'-10 "	23'- 2 "	30'- 7¼"
8	23'- 5¼"	30'- 5⅞"	24'- ⅜"	31'- 3¼"
9	24'- 4½"	31'- 2⅝"	25'- 0 "	32'- ¼"
10	25'- 4⅝"	32'- ¼"	26'- ⅜"	32'-10⅛"
11	26'- 5½"	32'-10¼"	27'- 1⅝"	33'- 8⅜"
12	27'- 7 "	33'- 9¼"	28'- 3⅜"	34'- 7⅝"
13	28'- 9¼"	34'- 8⅝"	29'- 6 "	35'- 7⅜"
14	29'-11⅝"	35'- 9 "	30'- 8⅞"	36'- 8 "

AMOUNT TO ADD TO COMMON RAFTER FOR 1 TO 11 INCHES IN BUILDING WIDTH

Rise	1	2	3	4	5	6	7	8	9	10	11
1 2 3	½	1	1½	2	2½	3⅛	3⅝	4⅛	4⅝	5⅛	5⅝
4	⅝	1⅛	1⅝	2⅛	2⅝	3¼	3¾	4¼	4¾	5¼	5⅞
5	⅝	1⅛	1⅝	2¼	2¾	3¼	3¾	4⅜	4⅞	5⅜	5⅞
6	⅝	1⅛	1⅝	2¼	2¾	3¼	3¾	4⅜	4⅞	5⅜	6
7	⅝	1⅛	1⅝	2⅜	3	3½	4	4⅝	5¼	5¾	6⅜
8	⅝	1¼	1¾	2⅜	3	3⅝	4⅛	4¾	5½	6	6⅝
9	⅝	1¼	1⅞	2½	3⅛	3¾	4⅜	5	5⅝	6¼	6⅞
10	⅝	1⅜	2	2⅝	3¼	3⅞	4½	5⅜	5⅞	6½	7⅛
11	¾	1⅜	2	2¾	3½	4⅛	4¾	5⅜	6⅛	6¾	7½
12	¾	1⅜	2⅛	2¾	3½	4¼	5	5⅝	6⅜	7	7¾
13	¾	1½	2¼	3	3⅝	4⅜	5⅛	6	6⅝	7⅜	8⅛
14	¾	1⅝	2⅜	3⅛	3⅞	4⅝	5⅜	6¼	6⅞	7¾	8½
15	¾	1⅝	2⅜	3¼	4	4¾	5⅝	6½	7¼	8	8¾
16	⅞	1¾	2½	3⅜	4⅛	5	5¾	6⅝	7½	8¼	9⅛
17	⅞	1¾	2½	3½	4¼	5⅛	6	7	7¾	8⅝	9½
18	⅞	1¾	2¾	3⅝	4½	5½	6⅜	7¼	8⅛	9	10
19	1	1⅞	2¾	3¾	4⅝	5½	6½	7¼	8⅜	9⅜	10¼
20	1	2	3	4	5	5⅞	6¾	7¾	8¾	9¾	10⅝
21	1	2	3	4	5	6	7	8	9	10⅛	11⅛
22	1	2	3⅛	4⅛	5⅛	6¼	7¼	8⅜	9⅜	10⅜	11½
23	1⅛	2⅛	3¼	4¼	5⅜	6½	7½	8⅝	9¾	10¾	11⅞
24	1⅛	2¼	3⅜	4½	5⅝	6¾	7⅞	9	10	11¼	12⅜
26	1¼	2⅜	3⅛	4¾	6	7⅛	8⅜	9½	10¾	11⅞	13⅛
28	1¼	2½	3⅞	5⅛	6⅜	7⅝	8⅞	10⅛	11½	12¾	14
30	1⅜	2⅝	4	5⅜	6¾	8	9½	10¾	12⅛	13½	14¾

TO FIGURE UNLISTED RISE TAKE ½ DIFFERENCE OF NUMBER OVER & NUMBER UNDER. EXAMPLE: 27" RISE 9" WIDTH. 10¾" TO 11½" = ⅜". ADDED TO SMALLER NUMBER = 11⅛".

AMOUNT TO ADD TO HIP-VAL RAFTER FOR 1 TO 11 INCHES IN BUILDING WIDTH

Rise	1	2	3	4	5	6	7	8	9	10	11
1	¾	1⅜	2⅛	2⅞	3½	4¼	4⅞	5⅝	6⅜	7	7¾
2	¾	1⅜	2⅛	2⅞	3½	4¼	5	5¾	6½	7⅛	7⅞
3	¾	1⅜	2⅛	2⅞	3⅝	4⅜	5	5¾	6½	7¼	7⅞
4	¾	1⅜	2¼	3	3⅝	4⅜	5⅛	5⅞	6½	7¼	8
5	¾	1½	2¼	3	3⅝	4⅜	5⅛	5⅞	6⅝	7⅜	8⅛
6	¾	1½	2¼	3	3¾	4½	5¼	6	6¾	7½	8¼
7	¾	1½	2¼	3	3¾	4⅝	5⅜	6⅛	6⅞	7⅝	8⅜
8	¾	1½	2⅜	3⅛	3⅞	4¾	5½	6¼	7	7¾	8⅝
9	¾	1½	2⅜	3¼	4	4¾	5⅝	6⅜	7¼	8	8⅞
10	⅞	1⅝	2½	3⅜	4⅛	4⅞	5¾	6⅝	7⅜	8¼	9
11	⅞	1¾	2½	3⅜	4¼	5	5⅞	6⅞	7½	8⅜	9¼
12	⅞	1¾	2⅝	3½	4⅜	5¼	6	6⅞	7¾	8⅝	9½
13	⅞	1¾	2⅝	3⅝	4½	5⅜	6⅜	7¼	7⅞	8⅞	9¾
14	⅞	1⅞	2¾	3⅝	4⅝	5½	6⅜	7⅜	8¼	9¼	10⅛
15	1	2	2⅞	3⅞	4¾	5¾	6⅝	7½	8½	9½	10⅜
16	1	2	3	4	5	5⅞	6¾	7¾	8¾	9¾	10⅝
17	1	2	3	4	5	6	7	8	9	10	11
18	1	2	3	4	5⅛	6⅛	7¼	8¼	9¼	10⅜	11⅜
19	1	2⅛	3¼	4¼	5¼	6⅜	7⅜	8½	9½	10⅝	11¾
20	1⅛	2¼	3¼	4⅜	5½	6½	7⅝	8¾	9⅞	10⅞	12
21	1⅛	2¼	3⅜	4½	5⅝	6¾	7⅞	9	10⅛	11¼	12⅜
22	1¼	2⅜	3½	4⅝	5⅞	7	8⅛	9¼	10⅜	11⅝	12¾
23	1¼	2⅜	3½	4¾	6	7¼	8⅜	9⅝	10¾	11⅞	13⅛
24	1¼	2½	3⅝	4⅞	6⅛	7⅜	8½	9¾	11	12¼	13½
26	1¼	2⅝	3⅞	5¼	6½	7¾	9	10⅜	11⅝	12⅞	14¼
28	1⅜	2¾	4⅛	5½	6⅞	8⅛	9½	10⅞	12¼	13⅝	15
30	1½	2⅞	4¼	5¾	7⅛	8⅝	10	11½	13	14⅜	15¾

TO FIGURE UNLISTED RISE TAKE ½ DIFFERENCE OF NUMBER OVER & NUMBER UNDER. EXAMPLE: 25" RISE 7" WIDTH. 8½" TO 9" = ¼". ADDED TO SMALLER NUMBER = 8¾".

DIFFERENCE IN LENGTH OF JACK RAFTERS OF VARIOUS SPACING

Rise	16"	18"	20"	24"
1	1'- 4 1/16"	1'- 6 1/8"	1'- 8 1/8"	2'- 1/8"
2	1'- 4 1/4"	1'- 6 1/4"	1'- 8 1/4"	2'- 3/8"
3	1'- 4 1/2"	1'- 6 1/2"	1'- 8 5/8"	2'- 3/4"
4	1'- 4 7/8"	1'- 7 "	1'- 9 1/8"	2'- 1 3/8"
5	1'- 5 3/8"	1'- 7 1/2"	1'- 9 5/8"	2'- 2 "
6	1'- 5 7/8"	1'- 8 1/8"	1'-10 3/8"	2'- 2 7/8"
7	1'- 6 1/2"	1'- 8 7/8"	1'-11 1/8"	2'- 3 7/8"
8	1'- 7 1/4"	1'- 9 5/8"	2'- 0 "	2'- 4 7/8"
9	1'- 8 "	1'-10 1/2"	2'- 1 "	2'- 6 "
10	1'- 8 7/8"	1'-11 3/8"	2'- 2 "	2'- 7 1/4"
11	1'- 9 3/4"	2'- 3/8"	2'- 3 1/8"	2'- 8 5/8"
12	1'-10 5/8"	2'- 1 1/2"	2'- 4 1/4"	2'-10 "
13	1'-11 5/8"	2'- 2 1/2"	2'- 5 1/2"	2'-11 3/8"
14	2'- 1/2"	2'- 3 5/8"	2'- 6 3/4"	3'- 7/8"
15	2'- 1 5/8"	2'- 4 3/4"	2'- 8 "	3'- 2 3/8"
16	2'- 2 5/8"	2'- 6 "	2'- 9 3/8"	3'- 4 "
17	2'- 3 3/4"	2'- 7 1/4"	2'-10 3/4"	3'- 5 5/8"
18	2'- 4 7/8"	2'- 8 1/2"	3'- 0 "	3 - 7 1/4"
19	2'- 6 "	2'- 9 3/4"	3'- 1 1/2"	3'- 9 "
20	2'- 7 1/8"	2'-11 "	3'- 2 7/8"	3'-10 5/8"
21	2'- 8 1/4"	3'- 1/4"	3'- 4 1/4"	4'- 3/8"
22	2'- 9 3/8"	3'- 1 5/8"	3'- 5 3/4"	4'- 2 1/8"
23	2'-10 5/8"	3'- 3 "	3'- 7 1/4"	4'- 3 7/8"
24	2'-11 3/4"	3'- 4 1/4"	3'- 8 3/4"	4'- 5 5/8"
26	3'- 2 1/4"	3'- 7 "	3'-11 7/8"	4'- 9 3/8"
28	3'- 4 1/2"	3'- 9 3/4"	4'- 2 3/4"	5'- 7/8"
30	3'- 7 "	4'- 1/2"	4'- 5 7/8"	5'- 4 5/8"

Decimal Equivalents of 8ths, 16ths, 32nds, 64ths

1/64	0.015 625
1/32	0.031 25
3/64	0.046 875
1/16	0.062 5
5/64	0.078 125
3/32	0.093 75
7/64	0.109 375
1/8	0.125
9/64	0.140 625
5/32	0.156 25
11/64	0.171 875
3/16	0.187 5
13/64	0.203 125
7/32	0.218 75
15/64	0.234 375
1/4	0.250
17/64	0.265 625
9/32	0.281 25
19/64	0.296 875
5/16	0.312 5
21/64	0.328 125
11/32	0.343 75
23/64	0.359 375
3/8	0.375
25/64	0.390 625
13/32	0.406 25
27/64	0.421 875
7/16	0.437 5
29/64	0.453 125
15/32	0.468 75
31/64	0.484 375
1/2	0.500
33/64	0.515 625
17/32	0.531 25
35/64	0.546 875
9/16	0.562 5
37/64	0.578 125
19/32	0.593 75
39/64	0.609 375
5/8	0.625
41/64	0.640 625
21/32	0.656 25
43/64	0.671 875
11/16	0.687 5
45/64	0.703 125
23/32	0.718 75
47/64	0.734 375
3/4	0.750
49/64	0.765 625
25/32	0.781 25
51/64	0.796 875
13/16	0.812 5
53/64	0.828 125
27/32	0.843 75
55/64	0.859 375
7/8	0.875
57/64	0.890 625
29/32	0.906 25
59/64	0.921 875
15/16	0.937 5
61/64	0.953 125
31/32	0.968 75
63/64	0.984 375

Decimal Equivalents of 7ths, 14ths, and 28ths

7th	14th	28th	Decimal	7th	14th	28th	Decimal
		1	.035714			15	.535714
	1		.071429	4			.571429
		3	.107143			17	.607143
1			.142857		9		.642867
		5	.178571			19	.678571
	3		.214286	5			.714286
		7	.25			21	.75
2			.285714		11		.785714
		9	.321429			23	.821429
	5		.357143	6			.857143
		11	.392857			25	.892857
3			.428571		13		.928571
		13	.464286			27	.964286
	7		.5				

Decimal Equivalents of 6ths, 12ths, and 24ths

6th	12th	24th	Decimal	6th	12th	24th	Decimal
		1	.041667	3			.5
	1		.083333			13	.541666
		3	.125		7		.583333
1			.166666			15	.625
		5	.208333	4			.666666
	3		.25			17	.708333
		7	.291666		9		.75
2			.333333			19	.791666
		9	.375	5			.833333
	5		.416666			21	.875
		11	.458333		11		.916666
						23	.958333

The Metric System of Measurement

Measures of Length

1 Millimeter (mm.) = ... 0.03937079 inch, or about 1/25 inch

10 Millimeters = 1 Centimeter (cm.) = ... 0.3937079 inch

10 Centimeters = 1 Decimeter (dm.) = ... 3.937079 inch

10 Decimeters = 1 Meter (m.) = ... 39.37079 inches, 3.2808992 feet, or 1.09361 yards

10 Meters = 1 Decameter (Dm.) = ... 32.808992 feet

10 Decameters = 1 Hectometer (Hm.) = ... 19.927817 rods

10 Hectometers = 1 Kilometer (Km.) = ... 1093.61 yards, or 0.6213824 mile

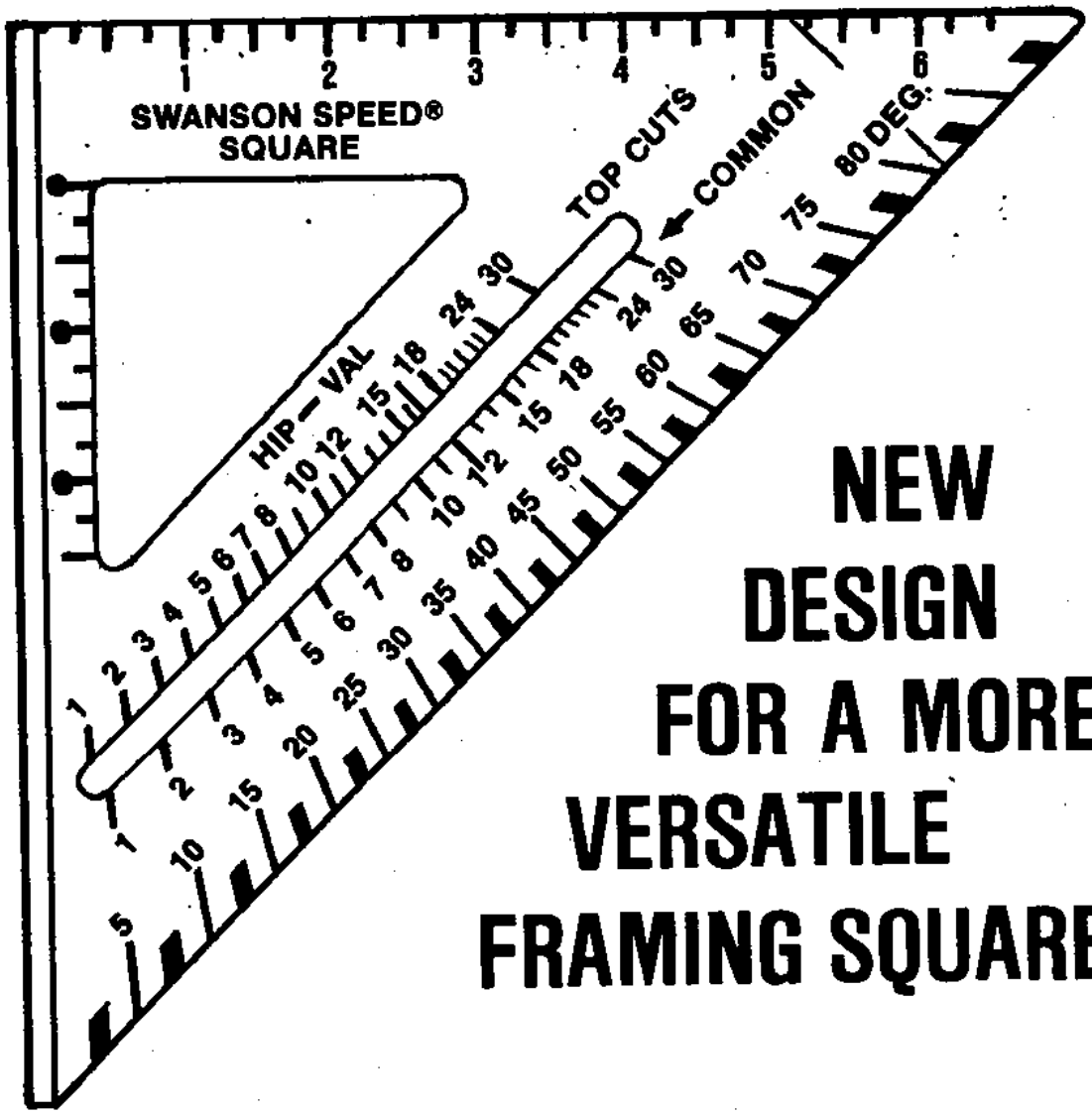
10 Kilometers = 1 Myriameter (Mm.) = ... 6.213824 miles

1 inch = 2.54 cm., 1 foot = 0.3048 m., 1 yard = 0.9144 m., 1 rod = 0.5029 Dm., 1 mile = 1.6093 Km.

When you know	*Multiply by*	*To Find*
inches	2.54	centimeters
feet	30.48	centimeters
yards	0.91	meters
miles	1.61	kilometers

On the other hand, if you know the metric measurement and want to know what it would be in the units that are familiar to you, you can multiply by the following conversion factors:

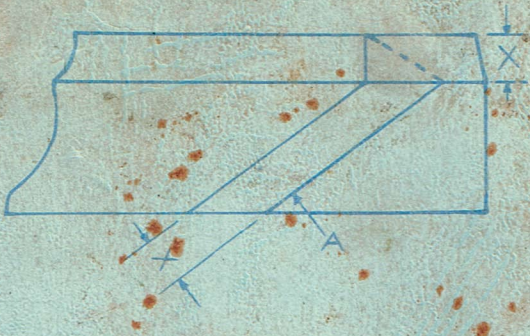
When you know	*Multiply by*	*To Find*
millimeters	0.04	inches
centimeters	0.39	inches
meters	3.28	feet
meters	1.09	yards
kilometers	0.62	miles



NEW DESIGN FOR A MORE VERSATILE FRAMING SQUARE

BOTH sides of **THE SWANSON SPEED® SQUARE** are now marked the same, with the addition of another 6" scale making either right or left hand usage possible.

Also incorporated is a scale along the edge of the "inner triangle" measuring from outside edge of square (edge with 6" scale on both sides). The "dotted" lines are the 1", 2", and 3" marks with ½ & ¼ inch in between. This helps to lay out or measure on both sides of a corner up to 3½ inches (width of stud) without changing the position of square. Both sides of square have this 3½" scale.



MARKING EDGE OR SIDE CUT

First, mark the proper PLUMB CUT (A). At right angles to plumb mark, measure a distance equal to thickness of rafter (X) and mark another plumb line. From this plumb line, square across top edge of rafter. Dotted line connects two points, and gives SIDE CUT. This would be the method used for "hand sawing". When using the electric saw, tilt the saw to cut a 45° angle, then cut along the plumb mark. Lay out and cut one rafter, and use it as a pattern to mark the rest.

SWANSON TOOL COMPANY, INC.
P. O. Box 434, Oak Lawn, Illinois 60453
Phone: (312) 599-9029