2007 State Competition
FFA Agricultural Mechanics Contest
University of Missouri
50 points

Contestant #_____
Contestant Name _____
Chapter _____

Woodworking and Carpentry

Directions: Please circle the appropriate answer or fill in the blank for each question. When you are finished please turn your sheet in. Remember to put your name, contestant number, and chapter on your paper. Not doing so will result in a zero for this section. If you have questions please feel free to ask.

I. Constructing a Sawhorse (20 points)

Materials Needed:

1. Rafter Framing Square
2. 1- 1x4 (1"x4") board approximately 10" long
3. Proper Saw

Directions:

1. Secure materials at a designated work station.
2. Examine Fig. 1 and Fig. 2 at the bottom of this page.
3. Cut the SHORT BRACE at the proper angle with the right saw at the correct length.

Fig. 1

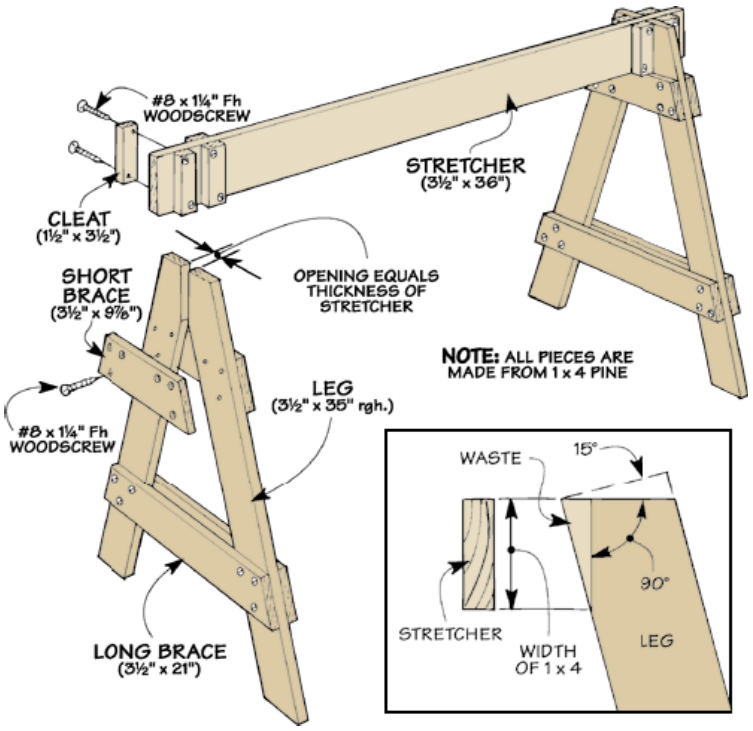
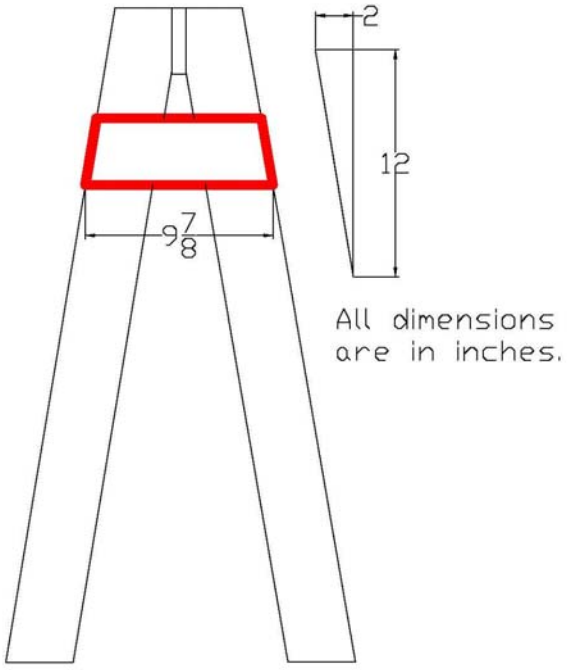


Fig. 2



II. Tool Identification (5 points)

Identify the proper tool for the task listed:
Circle the best answer.

1. Which hammer would be best suited for ripping? A. B. C. D.
2. Which fastener has the **least** amount of lateral (shear) force? A. B. C. D.
3. Which saw would be best for cutting a circle? A. B. C. D.

Identify the following tools:

4. Plumb Bob A. B. C. D. E.
5. Awl A. B. C. D. E.

III. Choosing the Proper Window (5 points)

Using the infrared thermometer, determine which window would provide the best thermal weather protection. *Briefly explain your answer.*
Circle the best answer.

A. B. C. D.

Why: _____

IV. Math Calculation (5 points)

A roof is set on a 4/12 slope and constructed out of ¾" grade C-C plywood. The dimensions of one side of the roof are 22' wide x 32' long. How many squares of asphault shingles are needed to cover **both** sides of the roof (excluding ridge cap and starters)? ***Show work for full credit*** (5 points)
Hint: One square of shingles covers 100 ft²

Number of squares needed: _____

V. Floor Joist Table (5 points)

Secure the floor plan layout from a CDE official. Note the dimensions of the floor joist. The 2”x12”s are Visually Graded No.3. Using Table 1 below, determine what is the Minimal **SPACING (inches on center)** that would allow you to use Visually Graded No. 2 2”x8”s.

Spacing (inches on center) _____

SOUTHERN PINE SPAN TABLES

Maximum spans given in feet and inches
Inside to inside of bearings

TABLE 1 FLOOR JOISTS – 30 PSF LIVE LOAD, 10 PSF DEAD LOAD, 360 DEFLECTION

SLEEPING ROOMS AND ATTIC FLOORS

Size (inches)	Spacing (inches on center)	Grade									
		Visually Graded				Machine Stress Rated (MSR)			Machine Evaluated Lumber (MEL)		
		SS	No.1	No.2	No.3	2400f - 2.0E	2250f - 1.9E	1950f - 1.7E	M23	M14	M29
2 x 6	12.0	12-3	12-0	11-10	10-5	12-9	12-6	12-0	12-3	12-0	12-0
	16.0	11-2	10-11	10-9	9-0	11-7	11-4	10-11	11-2	10-11	10-11
	19.2	10-6	10-4	10-1	8-3	10-10	10-8	10-4	10-6	10-4	10-4
	24.0	9-9	9-7	9-4	7-4	10-1	9-11	9-7	9-9	9-7	9-7
2 x 8	12.0	16-2	15-10	15-7	13-3	16-9	16-6	15-10	16-2	15-10	15-10
	16.0	14-8	14-5	14-2	11-6	15-3	15-0	14-5	14-8	14-5	14-5
	19.2	13-10	13-7	13-4	10-6	14-4	14-1	13-7	13-10	13-7	13-7
	24.0	12-10	12-7	12-4	9-5	13-4	13-1	12-7	12-10	12-7	12-7
2 x 10	12.0	20-8	20-3	19-10	15-8	21-5	21-0	20-3	20-8	20-3	20-3
	16.0	18-9	18-5	18-0	13-7	19-5	19-1	18-5	18-9	18-5	18-5
	19.2	17-8	17-4	16-5	12-5	18-3	18-0	17-4	17-8	17-4	17-4
	24.0	16-5	16-1	14-8	11-1	17-0	16-8	16-1	16-5	16-1	16-1
2 x 12	12.0	25-1	24-8	24-2	18-8	26-0	25-7	24-8	25-1	24-8	24-8
	16.0	22-10	22-5	21-1	16-2	23-7	23-3	22-5	22-10	22-5	22-5
	19.2	21-6	21-1	19-3	14-9	22-3	21-10	21-1	21-6	21-1	21-1
	24.0	19-11	19-6	17-2	13-2	20-8	20-3	19-7	19-11	19-7	19-7

VI. Hay Barn Capacity (5 points)

Secure Figure 1 and Figure 2 from a CDE official. Note the length and width of the building on Figure 1. Note how the hay is stacked on Fig. 2. If each bale weighs 2000 lbs. and is 6' in diameter, what is the capacity of the barn in tons? (Assume big round bales) **Show work and include units for full credit.**

Capacity of barn: _____

VII. Safety (5 points)

Use safe practices while cutting and throughout the entire Carpentry and Woodworking section of the contest.

Woodworking and Carpentry Scoring

Section	Possible	Earned
I. Constructing a Sawhorse	**20**	
Correct Length (9 7/8”)	5	_____
Correct Angle (2/12)	5	_____
Straight/Square Cut	5	_____
Proper Saw	5	_____
II. Tool ID	**5**	
1. Hammers	1	_____
2. Fasteners	1	_____
3. Saws	1	_____
4. Plumb Bob	1	_____
5. Awl	1	_____
III. Proper Window	**5**	_____
IV. Math Calculation	**5**	_____
V. Floor Joist Table	**5**	_____
VI. Hay Barn Capacity	**5**	_____
VII. Safety	**5**	_____
Total	**(50 pts)**	_____

The supported floor framing extends 26 feet with the support beam located in the center of the building. The original floor plan calls for 2” x 12”s; 24” O.C. The floor joists runs ½ the supported span.

Original Floor Plan

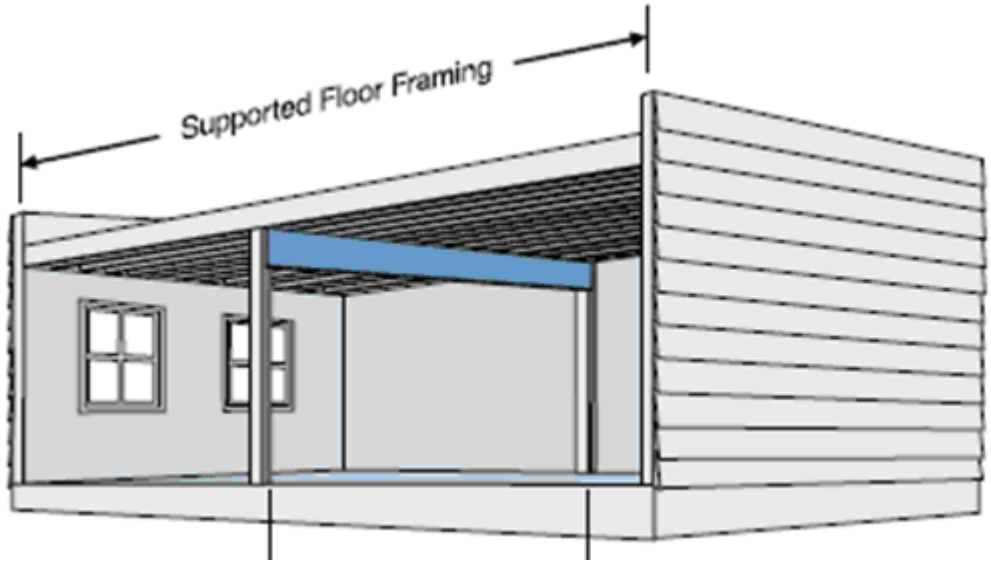


Figure 1
72’ x 24’

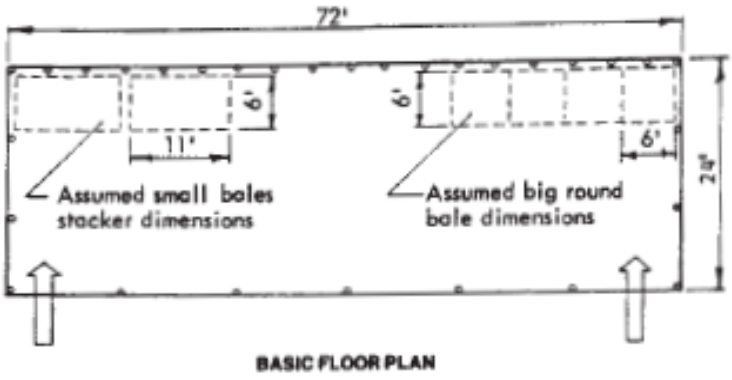


Figure 2